Letter 325

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June 4, 2001

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Dear Mr. Silva:

These comments are submitted concerning EOEA No. 10458, the Logan Airside Improvements Planning Project SDEIS/FEIR. I am a lifelong resident of one of Logan's many impacted communities having always lived in either Winthrop or East Boston. I am also a former Massport board member having served in that capacity for fourteen years from 1978 through 1992.

This project would expand the airside facilities of Logan Airport with two additions to the airport, runway 14/32 and a centerfield taxiway, and modifications to the existing instrument landing system by reducing the present minima on runways 22L, 15R, and 27. I oppose all of these proposals because they would increase the airside capacity of Logan Airport when the airport presently generates unacceptable levels of noise and toxic emissions for many residential communities beyond a five mile radius of the airport.

Runway 14/32

I am opposed to runway 14/32 because it would be the direct cause of tripling flights along the runway 15R approach/runway 33L departure flight path and the doubling of departures on runway 27. These orders-of-magnitude increases in flights would pass directly over some of the most densely populated residential communities in Massachusetts such as East Boston, Chelsea, Somerville, Everett, Malden, Roxbury, Jamaica Plain and others all of which presently experience the highest levels of noise and toxic air pollution from Logan Airport. These high noise and pollution levels are due primarily to the intense number of existing flights and the

very low altitudes at which the flights occur, invariably less than 2,000 ft. within a five mile radius from the airport (see Volume 2, figures 6.2-2, 6.2-3 and 6.2-4). From these low altitudes there is very little opportunity for pollutants to disperse anywhere but down onto the overflown communities.

Furthermore the forecast doubling of runway 27 takeoffs would greatly increase the impacts of full-throttle sideline noise on Winthrop's Point Shirley neighborhood, the Crystal Cove area, along the entire length of Washington Avenue, and both the Winthrop and Cottage Park Yacht Clubs.

Reduced Instrument Landing System Minima

The proposed reduction of the ILS minima would allow increased useage of runways 22L, 15R, and 27 during bad weather and foggy conditions. All three changes to the existing system would allow more bad weather flights over densely populated residential neighborhoods.

While the noise impacts from jet approaches are extremely severe under clear weather conditions the psychological apprehensiveness from approaching but invisible jet noise emanating from fog further contributes to the adverse health effects of such activity.

I am gravely concerned that these proposals to lower the ILS minima are direct violations of existing agency agreements not to lower them. Both Massport and the FAA are signatories to these agreements and the current proposals are an egregious breach of faith with Logan's neighboring communities. I specifically recall the formulation and acceptance of these agreements during my term as a Massport board member and will have no choice but to particpate as a witness in any forthcoming legal action to enforce them

Centerfield Taxiway

I oppose the proposed centerfield taxiway which would increase noise and pollution levels for Orient Heights, especially the Bayswater Street neighborhood which is one of the closest residential neighborhoods to active Logan runways and taxiways. The centerfield taxiway would increase the number of aircraft in close proximity to this neighborhood which presently suffers from very high noise and air pollution levels. Not only would the Orients Heights residential neighborhoods suffer but also Constitution Beach, East Boston's only public beach.

East Boston has suffered the loss of many public recreational facilities, open space and parks such as Wood Island Park, part of Frederick Law Olmsted's original green necklace for Boston, and entire neighborhoods such as Neptune Road for airport expansion. It is inconceivable that a further degradation of one of the few remaining such spaces is now being proposed for the same objective.

The centerfield taxiway has the potential for increasing runway incursion accidents at Logan Airport because it would cross two active runways, 15L/33R and 15R/33L, at their approximate mid-points.

There are a number of environmentally benign alternatives to the centerfield taxiway:

- The enforcement by Massport of it's own noise abatement ground procedures as codified in the Commonwealth of Massachusetts 740 CMR, specifically 24.05.(5), which regulates the flow of taxiing aircraft onto November taxiway.

- The enforcement by the FAA of it's own Boston Control Tower noise abatement order of May 1, 1991 which limits the number of turbojets on November Taxiway to five beyond runway 15L.

Both this state law and operational policy, if enforced by Massport and the FAA, would significantly reduce existing noise and pollution on November taxiway while simultaneously benefitting airline passengers by acting as a de-facto gatehold procedure to prevent aircraft from being cleared prematurely from the terminal only to then endure lengthy delays on the taxiway.

Environmental Justice

I am deeply concerned that the direct, causal effects of the three basic Logan expansion projects contained in the SDEIS/FEIR – runway 14/32, reduced bad weather landing minima and the centerfield taxiway – clearly violate both federal and state requirements for environmental justice with runway 14/32 being the worst offender of this noble public policy. The SDEIS/FEIR Preferred Alternative states clearly that runway 14/32 would be the direct cause of tripling runway 15R arrivals/runway 33L departures and doubling runway 27 departures. The densely populated residential communities under these flight tracks are among the most culturally

diverse in Massachusetts and often home to disproportionate levels of low income families. A recent study by Drs. Daniel R. Farber and Eric J. Krieg thoroughly demonstrates this social inequity, most clearly in table No. 13 on page 35 which shows that the most environmentally burdened towns in Massachusetts are very racially diverse and composed of above-average percentages of low income families. But these towns correlate nearly precisely with the very communities that would suffer the most from runway 14/32's order-of-magnitude overflight increases. In other words runway 14/32 appears to target Massachusetts's most environmentally overburdened, racially diverse low income communities.

Because of the importance of this issue I have attached a full copy of Drs. Farber and Krieg's study, entitled Unequal Exposure To Ecological Hazards: A Preliminary Report On Environmental Injustices In The Commonwealth Of Massachusetts.

The NOx Problem

The SDEIS/FEIR states that the further use of Logan Airport by stage–3 aircraft is an integral component of Massport's program to contain net noise exposure levels. However by Massport's own admission, in the 1999 ESPR (excerpts attached), stage–3 aircraft generate much higher amounts of NOx emissions, which contribute to global warming effects and cause respiratory health impacts in Logan's surrounding communities, than other aircraft types. Secretary Robert Durand confirmed Massport's troublesome forecast in his 1999 ESPR scoping certificate (excerpts attached) which predicted that Logan would be one of the three largest sources of NOx emissions by 2010. Massport's accelerated stage–3 aircraft schedule appears to confirm the Secretary's dire warning.

Adequacy of SDEIS/FEIR Document

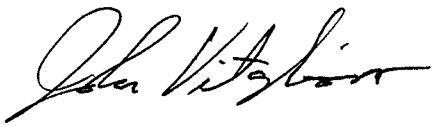
The Logan SDEIS/FEIR document is seriously inadequate in many important areas:

- It fails to describe community concerns about all three proposals; runway 14/32, the centerfield taxiway and the reduced ILS minima.
- It fails to disclose the existing Massport/FAA agreement not to lower the ILS minimums.
- It fails to disclose the 740 CMR regulations and the May 1, 1991 FAA control tower policy described herein.

- It fails to adequately consider demand-management alternatives such as peak-hour pricing and slot allocation policies to address peak hour congestion.
- It fails to measure and describe the health effects – respiratory, cardiovascular and cancer incidences – of Logan's operations while failing to acknowledge the Winthrop AIR Environment–Health Committee study of 2000.
- It fails to consider alternatives to the centerfield taxiway such as improved terminal gatehold procedures which would significantly reduce the number of aircraft idling on November taxiway. The new Terminal A and FIS gate positions will enhance the viability of this option.
- Another important document inadequacy is it's total failure to include the airside data in the Comments of the Massport Logan Community Advisory Committee (CAC) Report of the Consultants to the CAC document, cover page attached. This Massport–funded document is replete with airside data that contradicts the data in the SDEIS/FEIR in many critical areas. For example the CAC report demonstrates that, based on recent field observations, the number of regional jets actually using Logan is higher by an order-of-magnitude than the forecast number in the SDEIS/FEIR. This discrepancy is important because a large proportion of the regional jet fleet will not utilize a 5,000 ft. runway, as demonstrated by actual practice at other airports.
- The document fails to fully disclose the land-use impacts of developing a replacement facility for Building 60, the huge cargo building that would need to be demolished for runway 14/32. The precise location of a replacement facility, groundside transportation impacts and the opportunity costs associated with this project are important issues not included in the SDEIS/FEIR.
- The document is inadequate because it fails to disclose the critical issue of increased NOx emissions associated with stage-3 aircraft operations, and fails to discuss any possible mitigation programs to alleviate this serious health hazard.

I recommend that Secretary Durand and the FAA reject the Logan Airport SDEIS/FEIR and direct Massport to initiate a new program that would development and institute improved demand-management programs to accommodate Logan operations, that would identify the health impacts of Logan Airport on it's neighboring communities and develop meaningful programs to reduce those impacts.

Sincerely,



John Vitagliano

:attachments

7

Air Quality Emissions Reduction

Air Quality Emissions Reduction Highlights

1999 Air Quality Conditions

Massport continues to achieve reductions in air emissions associated with activities at Logan Airport through numerous initiatives. These include the Alternative Fuels Program; operation of the new Jet Fuel Storage and Distribution System; increasing the percentage of high-occupancy vehicles (HOV) accessing the airport; and other measures.

For the 1999 analysis the modeling methodology for assessing air quality emissions at Logan Airport has been refined to better reflect actual conditions. The Emissions Inventory was conducted using the Federal Aviation Administration -required Emissions and Dispersion Modeling System (EDMS) model instead of the Logan Dispersion Modeling System (LDMS); and motor vehicles emissions were estimated using the MOBILE5a_h model, to be consistent with the modeling done for the State Implementation Plan by the Massachusetts Department of Environmental Protection (DEP).

The highlights for 1999 are summarized below:

- In 1999, emissions of volatile organic compounds (VOCs) from all sources associated with Logan Airport were 9 percent lower than in 1998. This is primarily attributable to reduced VOC emissions from the 1999 aircraft fleet mix.
- The increased dominance of Stage 3 (quieter) aircraft in the fleet, while improving the noise environment, is associated with an increase in nitrogen oxide (NOx) emissions.
- NOx emissions from all airport-related sources in 1999 were 2 percent higher than 1998 levels. This is primarily attributed to increases in emissions of NOx from aircraft.
- Total carbon monoxide (CO) emissions at Logan Airport was approximately 3 percent higher in 1999 than in 1998. The increase is related to the increased number of ground service equipment (GSE) vehicles needed to service aircraft operations, particularly for the more GSE-intensive cargo and air carrier aircraft.
- In 1999, of all the validated nitrogen dioxide (NO_2) levels at monitoring sites located on or in the vicinity of Logan Airport were within the National Ambient Air Quality Standard (NAAQS) of 100 $\mu g/m^3$, averaging 48.9 $\mu g/m^3$ overall.

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Oxides of Nitrogen (NOx)

Aircraft technologies have favored quieter, more fuel-efficient engines over noisier, less fuel-efficient engines. By-products of these improvements are a decrease in VOC emissions, but an increase in NOx emissions.

NOx emissions from all airport-related sources in 1999 were 4 percent higher than 1998 levels. This is primarily attributed to increases in emissions of NOx from aircraft. The increase in NOx emissions from GSE is directly related to the aircraft fleet mix. Stationary source emissions of NOx are lower in 1999 because source activity decreased from 1998. For comparison, Table 7-4 contains the historical NOx emissions at Logan Airport. Figure 7-2 depicts the trends in NOx emissions trends since 1990.

Table 7-4
Estimated NOx Emissions (in kg/day) at Logan Airport

	LDMS*							EDMS*	
Source Categories	1990	1993	1994	1995	1996	1997	1998	1998*	1999*
Aircraft Sources									
Air carriers	4,554	4,271	4,317	3,861	3,781	4,150	4,236	4,471	4,699
Commuter aircraft	133	202	158	192	137	159	172	203	139
Cargo aircraft	237	213	257	332	363	262	274	254	277
General aviation	13	13	13	17	18	21	3	5	27
Total aircraft sources	4,937	4,699	4,745	4,402	4,389	4,592	4,685	4,933	5,142
Ground Service Equipment	603	722	617	607	588**	622**	608**	317**	329**
Motor Vehicles									
TWT through-traffic	NA	NA	NA	NA	NA	NA	NA	NA	22
Parking/curbside	25	25	24	24	24	24	24	37	38
On-airport vehicles	232	240	239	229	257***	244***	252***	372**	369+
Total motor vehicle sources	257	265	263	253	281	268	276	409	429
Other Sources									
Fuel storage/handling	0	0	0	0	0	0	0	0	0
Miscellaneous sources++	344	278	330	320	275	244	284	284	174
Total other sources	344	278	330	320	275	244	284	284	174
Total airport sources	6,141	5,964	5,955	5,582	5,533	5,726	5,853	5,943	6,074

* 1990 through 1998 were calculated using the Logan Dispersion Modeling System and MOBILE5a. 1998 was re-calculated using the FAA's Emissions and Dispersion Modeling System (EDMS 3.22) and MOBILE5a_h, the models that were also used for 1999 and 2015.

** Includes vehicles and equipment converted to alternative fuels.

*** Includes through traffic from Ted Williams Tunnel not destined for Logan Airport.

\+ Includes reductions attributable to CNG shuttle buses, as calculated by the West Virginia University Transportable Emission Testing Laboratories in March 1999.

++ Includes the Central Heating/Cooling Plant, emergency electricity generation, and other stationary sources.

NA Not Available

1 kg/day is approximately equivalent to 0.402 tons per year (tpy)

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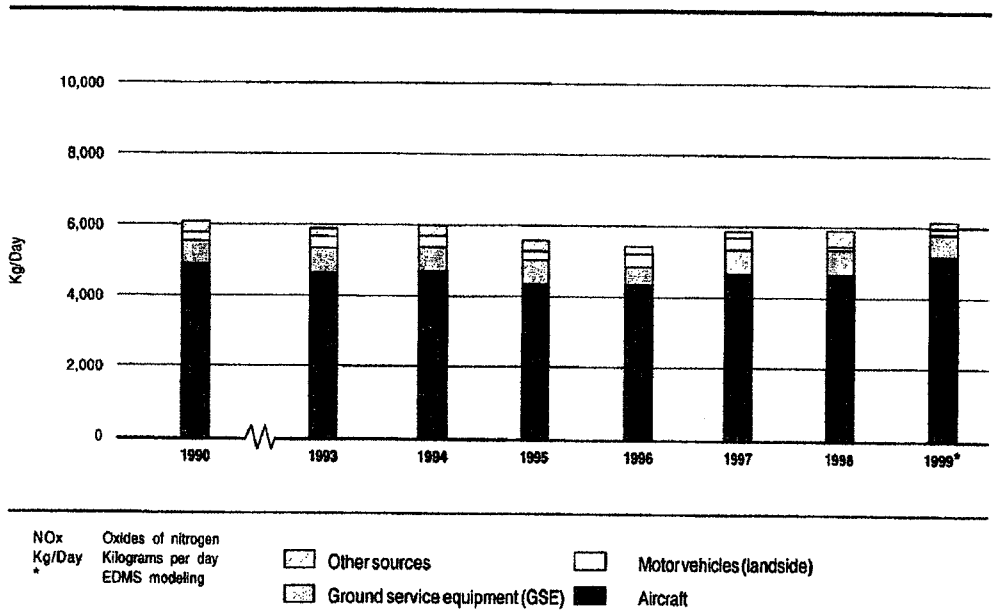
Figure 7-2
Emissions of NOx at Logan Airport



In the *1994/5 GEIR*, total emissions of NOx were projected to be 6,704 kg/day in 1999. Despite differences in fleet mix, the emissions projections for aircraft were very close to the actual 1999 emission quantified in this *1999 ESPR*. GSE and stationary sources emitted lower amounts than originally projected in 1994/5, and motor vehicle sources emitted higher amounts.

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Emissions of NOx in 2015 are expected to be 29 percent higher than in 1999, almost entirely a result of the changing aircraft fleet and increased operations of more efficient aircraft engines. The influence of Stage 3 aircraft, which emit more NOx and fewer VOCs than Stage 2 aircraft because of their higher combustion temperatures, is apparent in the emissions inventory—although aircraft operations are predicted to increase only by about 17 percent over 1999 levels, emissions of NOx from aircraft are 33 percent higher in 2015. Second, the taxi/idle time in mode is expected to be approximately 7 percent higher in 2015 than in 1999, based on the airport layout. Importantly, these estimates do not account for the proposed airside improvements that will help to reduce these taxi/idle times and, accordingly, emissions. The current projections for 2015 do not fully incorporate technical innovations that are likely to be in effect at that time.

Aircraft emissions of CO generally occur at the highest rate during the taxi/idle mode. Therefore, increased taxi/idle times lead to greater emissions of CO. In the 2015 analysis, aircraft have a higher taxi/idle time than in 1999 since none of the proposed airside improvements that would decrease time-in-mode have been included. Additionally, an increase in operations and passenger levels is expected to lead to increased emissions from aircraft and associated GSE. Correspondingly, total emissions of CO are projected to be nearly 29 percent higher in 2015 than in 1999.

Motor Vehicle Emissions in the East Boston and Metropolitan Study Areas

Emissions of VOCs, NOx, and CO were also estimated for the East Boston and Metropolitan Study Areas (see Chapter 5 and Figure 5-11). Emissions factors for motor vehicles decrease from 1999 to 2015 because of stricter Federal emissions standards on engines, while motor vehicle traffic increases. Total East Boston and Metropolitan Study Area automobile traffic both increase at a higher rate than airport-related traffic.

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December 10, 1999

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ESTABLISHING THE SCOPE FOR THE 1999 LOGAN AIRPORT ENVIRONMENTAL STATUS AND PLANNING REPORT AND CERTIFICATE ON THE 1998 ANNUAL UPDATE

PROJECT NAME	: Logan Airport Environmental Status and Planning Report (formerly the Logan Airport Generic Environmental Impact Report)
PROJECT MUNICIPALITY	: Boston/ Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: October 23, 1999

As Secretary of Environmental Affairs, I hereby find that the 1998 Annual Update to the Logan Airport Generic Environmental Impact Report (GEIR) adequately and properly complies with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00). I also hereby establish the scope for the analysis to be presented in the 1999 Logan Airport Environmental Status and Planning Report (or "ESPR," the new name for the GEIR).

1998 Annual Update

The Annual Update has served its purpose of providing a relatively concise summary of 1998 activity and impact levels. The Annual Update reports a 3.8% increase in passenger levels over 1997 (a 10.2% increase in international passengers), and a 5.2% increase in aircraft operations. In 1997, Logan Airport ranked as one of the ten busiest airports in the world in terms of aircraft operations. The Annual Update has described a number of positive events in 1998 (for example, a decrease in noise-exposed population, decreases in VOC and CO emissions, and an increase in Blue Line ridership and HOV ridership). However, the 1998 Annual Update also showed that CNI for nighttime operations and for cargo jets increased. In addition, overall airport operations became less efficient as (for the second year in a row) increases in number of operations

Air Quality

Logan Airport currently ranks as the sixth largest source of NO_x emissions in the Commonwealth, and by 2010 it is likely to become one of the three largest such sources. Currently, aircraft emissions are the only mobile air pollution sources included in the State Implementation Plan (SIP) emissions inventory that are not slated for meaningful near- or long-term emissions reductions. As I stressed in the Airside DEIR Certificate, it is the total air pollution from the airport which requires mitigation -- whether from planes, the ground fleet servicing these aircraft, or the vehicles carrying passengers and employees. It is time to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future.

Within the overall policy goal of reducing or minimizing impacts as passenger levels rise, Massport has committed to investigating methods of reducing emissions from each of the airport's major sources of air emissions. The Certificate on the Airside DEIR requested the development of a system of emission-based landing fees as a legally viable method of encouraging emission reductions (particularly of NO_x) from Logan Airport. This would be a system of market-based, revenue-neutral landing fees that reward cleaner planes with lower charges, on the principle that "the polluter pays." Airports in Europe, notably Zurich, are beginning to institute programs of this kind. The ESPR Proposed Scope includes the outline of a study of a market based landing fee system based on emissions. **C.3**

I am pleased that Massport has committed to work actively on a program that holds such promise for air quality. The ESPR scope proposes the following process. First, Massport will model the emissions reductions attainable under a market-based emissions fee program, considered independent on any legal constraints on implementing such a program. Second, Massport will examine the effectiveness and practicability of alternative programs (such as purchases of emissions credits, or on-site emissions reduction in ground service vehicles) that would provide equivalent levels of reductions. Finally, Massport will develop an implementation program, including appropriate regulatory proposals (such as incorporation into the State Implementation Plan).

I welcome the opportunity to work with Massport further on this issue, and pledge the full cooperation of the EOEA agencies in helping Massport develop its program, including further input on how to measure reductions and ensuring their enforceability. The ESPR should consider the effectiveness and feasibility of extending any such program to other pollutants as well. I acknowledge that VOC and CO emissions are expected to remain under current levels for some time, and only show net long term increases under the highest growth scenarios in aircraft operations. Nonetheless, it makes sense to formalize a commitment to continue reducing these emissions, consistent with Massport's mandate under MEPA and its environmental goal of minimizing overall impacts as passenger levels rise.

Comments of the Massport Logan Community Advisory Committee (CAC)

Report of the Consultants to the CAC

prepared on
May 23, 2001

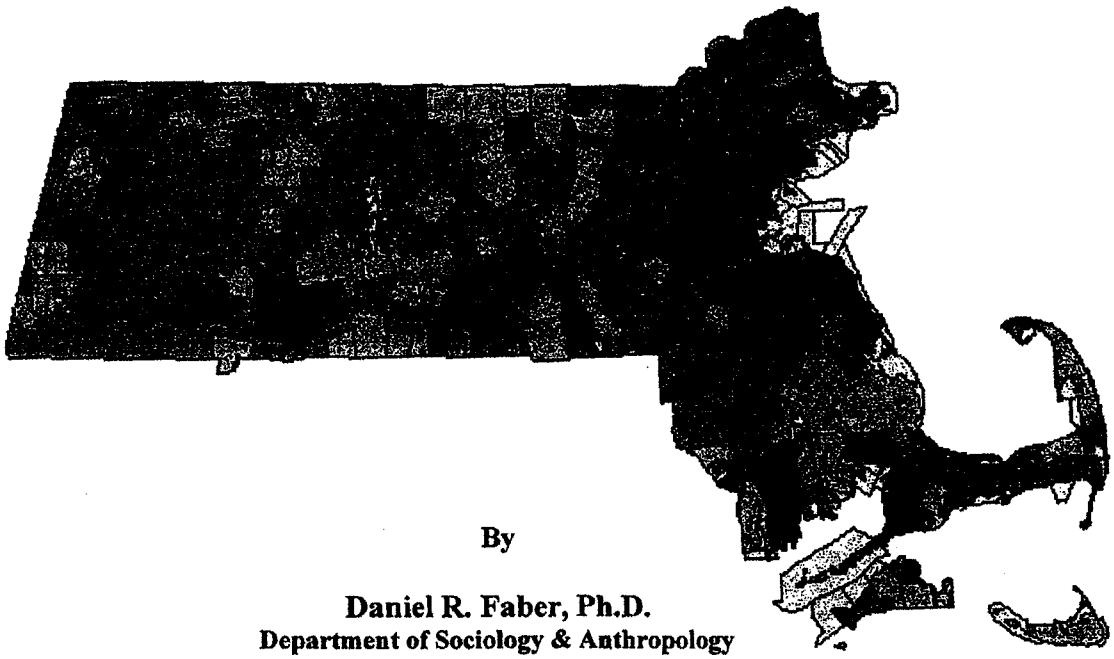
on the
Logan
Airside Improvements Planning Project

and the

FAA Supplemental Draft Environmental Impact Statement (SDEIS)
and
Massport Final Environmental Impact Report EOEA #10458 (FEIR)
dated March 2001

UNEQUAL EXPOSURE TO ECOLOGICAL HAZARDS:

A PRELIMINARY REPORT ON ENVIRONMENTAL INJUSTICES IN THE COMMONWEALTH OF MASSACHUSETTS



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See Page 35
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Prepared June 27, 2000

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UNEQUAL EXPOSURE TO ECOLOGICAL HAZARDS:
A PRELIMINARY REPORT ON ENVIRONMENTAL INJUSTICES IN THE COMMONWEALTH OF MASSACHUSETTS

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Preliminary Report
Prepared June 27, 2000

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Appendix B: Town by Town Summaries of Hazardous Facilities and Sites

Methodology:

This report explores whether environmentally hazardous industrial facilities, power plants, municipal solid waste combustors (incinerators), toxic waste sites, landfills of all types, and trash transfer stations are unequally distributed with respect to the income and/or racial status of a community in the Commonwealth of Massachusetts. Utilizing demographic data from the 1990 Census, as well as current data provided by the Massachusetts Department of Environmental Protection (DEP), United States Environmental Protection Agency (EPA), and the Massachusetts Toxics Use Reduction Institute, we analyzes the exposure rates of all 351 cities and towns (minor civil divisions, or MCDs) in the state to the environmentally hazardous industrial facilities and sites listed above. In addition to these 351 cities and towns, we also include seven sub-towns or neighborhoods within the larger town of Barnstable: Barnstable; Centerville; Cotuit; Hyannis; Marstons Mills; Osterville; and West Barnstable. We also include twelve sub-towns or neighborhoods within the larger city of Boston: Allston/Brighton; Charlestown; Dorchester; Downtown Boston; East Boston; Hyde Park; Jamaica Plain; Mattapan; Roslindale; Roxbury; South Boston; and West Roxbury (for the purposes of the report, Downtown Boston encompasses Central Boston and Chinatown, Back Bay and Beacon Hill, the South End, and the Fenway/Kenmore neighborhoods). As a result, a total of 370 communities are analyzed in the report.

Each of the 370 communities was classified according to its class and racial status. The class status of a community was determined by the average median household income: (1) *low income*: $0 to $29,999; (2) *medium-low income*: $30,000-$39,999; (3) *medium-high income*: $40,000-$49,999; and (4) *high income*: $50,000 and greater. The racial status of a community was determined by the percentage of total population made up of people of color: (1) *low minority status*: less than 5% people of color; (2) *moderately-low minority status*: 5 to 14.99%; (3) *moderately-high minority status*: 15 to 24.99%; and (4) *high minority status*: 25% and greater. Comparisons were then made of low-to-high income communities and low minority-to-high minority status communities in terms of exposure rates to environmentally hazardous industrial facilities, waste sites, and landfills of all types. Among our findings: *low-income communities face a cumulative exposure rate to environmentally hazardous facilities and sites which is 3.13 to 4.04 times greater than all other communities (measured by median household income) in the state.* In addition, *communities of high minority status face a cumulative exposure rate to environmentally hazardous facilities and sites which is nearly nine times greater than communities of low-minority status.* Clearly, not all communities in Massachusetts are polluted equally – as lower-income communities and communities of color are disproportionately impacted.

Acknowledgments:

For their invaluable research assistance, we would like to thank Kristin Fredricks and Trish Zilliox, as well as Eric Bourgeois and Allison Grossman, all of the Northeastern University. We would also like to extend our gratitude to Heather Tenney at the Toxics Use Reduction Institute, University of Massachusetts at Lowell. Walter Hope, Susan Peck, Sarah Weinstein, Paul Bakely, Philip Weinberg, and many others at the Department of Environmental Protection (DEP) were of great help in the data collection process, as was Paul Hunter at the Massachusetts Department of Public Health. We would like to extend our appreciation to Penn Loh of Alternatives for Community and Environment (ACE); Khalida Smalls of the Greater Boston Environmental Justice Network (GBEJN), Veronica Eady at the Executive Office of Environmental Affairs; Matt Wilson of the Toxics Action Center;, Paul Burns at MASSPIRG; and Debra George of the Northeast Environmental Justice Network for their comments on an earlier draft of this report. The authors remain solely responsible for the content of this preliminary report.

UNEQUAL EXPOSURE TO ECOLOGICAL HAZARDS: SUMMARY OF FINDINGS

The Commonwealth of Massachusetts is plagued by a number of significant environmental problems impacting the quality of life of our citizens. There are over 21,030 Department of Environmental Protection (DEP) hazardous waste sites in the state. Some 3,389 of these sites are considered to pose serious environmental and human health threats, and include 32 sites on the Environmental Protection Agency's National Priorities List (NPL) or Superfund list. Between 1990-98, some 1,029 large industrial facilities produced some 164,385,598 pounds of toxic chemical waste which was *released* on-site directly into the environment (discharged into the air, ground, underground, or adjacent bodies of water) of the communities in which they were located -- an amount equivalent to 2055 tractor-trailer trucks each loaded with 80,000 pounds of toxic waste.

Coal and oil-burning power plants, specifically those plants built prior to 1977, are also a major source of air pollution in the state. In fact, utilities in Massachusetts are responsible for over 60 percent of the state's soot-forming sulfur dioxide emissions, 15 percent of the state's smog-causing nitrogen oxide emissions and 30 percent of the state's heat-trapping carbon dioxide emissions. Sulfur dioxide (SO_2) emissions are the main precursor to the creation of soot -- tiny particles of soot which penetrate deep into the throat and lungs (and causes an estimated 1,500 premature deaths each year in the northeastern region of the U.S., according to the American Lung Association). Fossil-fuel power plants are also responsible for more than 800 pounds of airborne mercury emissions every year. Mercury causes severe damage the neurological system and has developmental effects on fetuses and small children Every county in Massachusetts has levels of key air-borne toxic chemicals in the form of volatile organic compounds (VOCs) that exceed health-based state levels. Concentrations of benzene, 1,3-butadiene, formaldehyde and acrolein -- chemicals which are known to cause numerous adverse health effects, including neurological disorders, birth defects, reproductive disorders and respiratory diseases -- exceed the health-based risk standards in all counties *by up to 80 times.* As a result, the Massachusetts Public Interest Research Group (MASSPIRG) estimates that air pollution annually kills at least 1,000 people in the state.

Work-related health and safety tragedies are a daily affair as well. It is estimated in 1998 and 1999 alone, 132 workers died on the job; over 2,000 more died from occupational diseases; 2,400 workers were diagnosed with cancer caused by their jobs; and over 100,000 workers were seriously injured on the job in the state. During the 13-year period, 1986-2000, 259 out of 351 cities and towns have had a worker killed on the job from acute traumatic injuries – over two-thirds of all the municipalities in Massachusetts. Figures also show that over a two-and-a-quarter year period beginning in 1997, sixty-two workers were killed on the job in the state due to

employers' failure to comply with required OSHA regulations.[1]

While the quality of life for all citizens in the Commonwealth is currently compromised by these environmental and human health problems, not all segments of the citizenry are impacted equally. This report documents the unequal exposure to environmental hazards. In order to bolster profits and competitiveness, Massachusetts-based industry typically adopts pollution strategies which are not only more economically efficient but that also offer the path of least political resistance. The less political power a community of people possesses; the fewer resources a community has to defend itself; the lower the level of community awareness and mobilization against potential ecological threats; the more likely they are to experience arduous environmental and human health problems at the hands of government and industry. And in Massachusetts, lower-income communities and communities of color are unequally exposed to a greater ecological burden.

This is not say that white middle-to-upper income communities are not also being significantly impacted by industrial pollution in Massachusetts. But in contrast to the types of economic and social constraints confronting people of color and white working-class families, higher- income salaried and professional workers can often buy themselves access to ecological amenities and a cleaner environment in non-industrial urban, suburban and rural areas. In fact, lower-income families and people of color face a much greater "triple unequal exposure effect" to toxic pollution and other environmental hazards in comparison with higher-income residents. For lower-income communities and communities of color, this takes the form of exposure to: (1) greater concentrations of polluting industrial facilities and power plants; (2) greater concentrations of hazardous waste sites and disposal/treatment facilities, including landfills, incinerators, and trash transfer stations; and (3) higher rates of "on the job" exposure to toxic pollutants inside the factory. Unequal exposure to environmental hazards is thus experienced by lower-income families and people of color in terms of where they work, live, and play.

This report provides evidence to suggest that working class communities and communities of color are unfairly targeted as sites for toxic waste disposal, incinerators, landfills, trash transfer stations, power plants, and polluting industrial facilities because they lack the political power and economic resources necessary to adequately protect their interests. In some cases, not only are new toxic facilities and dump sites located in poorer communities and communities of color, but as in the case of the public housing development and playgrounds near the Alewife station in Cambridge, people of color and low-income families are sometimes located on top of old hazardous waste sites and/or nearby polluting facilities.

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[1] It would currently take the Occupational Safety and Health Administration 118 years to inspect each workplace in Massachusetts under their jurisdiction just once, given current budgetary and inspector shortages. See the 1999 and 2000 editions of *Dying for Work in Massachusetts: The Loss of Life and Limb in Massachusetts Workplaces*, A Report by MassCOSH and Western MassCOSH (April 28, 1999-2000), p.ii-13.

In this report, we will document the disproportionate environmental burden borne by these communities in the following areas:

(1) **Unequal Exposure to Hazardous Waste Sites:** In Massachusetts, low-income communities, where the average household medium income is $29,999 or less, contain an average of 120.9 DEP hazardous waste sites. In contrast, communities where the average income is $30,000 or greater, contain an average of 41.9 to 50.2 hazardous waste sites. As a result, *low-income communities average roughly two-to-three times more DEP hazardous waste sites than higher-income communities*. Low-income communities also average nearly 14 hazardous waste sites per square mile. In contrast, higher-income status communities, where the household median income is $30,000 or greater, average 3.1 to 4.1 hazardous waste sites per square mile. As a result, low-income communities have about *three-and-a-half to almost four times* the number of hazardous waste sites per square mile as higher-income communities. These figures remain relatively consistent with comparisons of the more serious Tier I-II hazardous waste sites.

Likewise, low-minority status communities, where less than 5% of the population is made up of people of color, average 41.2 hazardous waste sites. In contrast, high minority status communities, where 25% or more of the population is made up of people of color, average 162.5 sites. Communities of moderately-high minority status, where 15 to 24.99% of the population is made up of people of color, average nearly 190 sites. As a result, *higher minority status communities, where 15% or more of the population is made up of people of color, average well over four times as many hazardous waste sites per town as low-minority status communities.* High minority status communities also average 27.2 DEP hazardous waste sites per square mile. In contrast, low-minority status communities average 2.9 hazardous waste sites per square mile. As a result, *high-minority status communities have more than nine times the number of hazardous waste sites per square mile as compared to low-minority status communities*. These figures remain consistent with comparisons of the more serious Tier I-II hazardous waste sites. In short, *communities of color and low-income communities experience a far more profound exposure rate to DEP hazardous waste sites than wealthier, white communities, indicating that racial and class biases appear to be significant factors in determining the location of Tier and Non-Tier hazardous waste sites in the Commonwealth of Massachusetts.*

(2) **Unequal Exposure to Landfills:** There are a total of 954 different landfill-types in the Commonwealth, of which the majority (566) are garbage dumps. Most of the state's landfills and trash transfer stations are more heavily concentrated in lower-income communities and communities of color. In comparison to low-minority status communities (where less than 5 percent of the population are people of color), which average .13 of all landfill types per square mile, high-minority status communities (where 25 percent or more of the community are people of color) average .36 of these facilities per square mile, *a rate nearly three times higher*. In low-income communities (where the median household income is less than $30,000), there are .18 of these landfill-types per square mile, a figure slightly higher than the .13-.15 rates for higher-income communities. However, when municipal solid waste landfills are excluded in a closer inspection of the data, it is clear the lower-income communities ($39,999 or lower) have a much

high proportion of every other type of landfill than higher-income communities ($40,000 or higher). For instance, while lower-income communities ($39,999 or lower) make up 50.8 percent of all towns in the state, they are home to 58.9 percent of all incinerator ash landfills, 66.7 percent of all demolition landfills, 71.4 percent of all illegal sites, 74.5 percent of all sludge landfills, 69.5 percent of all tire piles, and 58.9 percent of all transfer stations. Clearly, racial and class biases are both present in determining the location of all landfill-types (with the exception of garbage dumps) on a community-basis.

(3) **Unequal Exposure to Polluting Industrial Facilities:** Lower-income communities (average median household income of $39,999 or less) comprise 50.8 percent of all communities in Massachusetts, but *received 78.7 percent of all chemical emissions from large-scale industries reporting under the Toxics Use Reduction Act (TURA) between 1990-98.* In fact, low-income communities (with average household median incomes of $29,999 or less) average 6.3 TURA industrial facilities per town, some 932, 910 total pounds of chemical emissions released into the environment per town, and some 73,061 total pounds of chemical emissions per every square mile of town space for 1990-98. This contrasts sharply in comparison to moderately-high income communities (average household median income of $40-49,999), which have an average of 1.8 TURA polluting facilites per town, an average of 161,028 total pounds of chemical emissions per town, and 10,937 pounds of chemical emissions per every square mile of town space. *In comparison to upper-income communities (median household income $40,000 or greater), low-income communities average over three times as many TURA industrial facilities, three times as many TURA industrial facilities per square mile, 3.75 to 5.79 times as many pounds of chemical emissions into the environment per town; and roughly seven times as many pounds of chemical emissions per square mile . Thus, it would appear that the class status of a community is a major determinant in the level of exposure to TURA industrial facilities and emissions. The data would seem to indicate that lower-income communities bear a greatly disproportionate portion of the pollution emitted by these types of industrial facilities, and are clearly overburdened.*

Communities of color are also overburdened. High-minority status communities (where 25 percent of the population or more are people of color) average 8.8 TURA industrial facilities per town and 1.1 TURA facilities per square mile, compared to an average of just 2 facilities and .12 facilities per square mile for low-minority status communities (where less than five percent of the population are people of color). *In short, high-minority status communities average over four times as many TURA industrial facilities and over nine times as many TURA industrial facilities per square mile as low-minority status communities in the Commonwealth.* Furthermore, higher-minority status communities (where 15 percent or more of the population are people of color) average 1,061,041 to 1,216,360 total pounds of chemical emissions from TURA industrial facilities and from 110,718 to 123,770 pounds of chemical emissions from TURA facilities per square mile for 1990-98, compared to just 342,579 pounds of total chemical emissions and 22,735 pounds of chemical emissions per square mile for low-minority status communities. Thus, *in comparison to low-minority status communities, higher-minority status communities average roughly 3 to 3.5 more times as many pounds of chemical emissions*

released into the environment from local TURA facilities; and 4.86 to 5.44 more times as many pounds of chemical emissions per square mile. Thus, it would appear that the racial status of a community is once again a major determinant in the level of exposure to TURA industrial facilities and pollution. The data would seem to indicate that communities of color bear a greatly disproportionate burden of the pollution emitted by these types of facilities.

(4) **Unequal Exposure to Power Plants:** Although higher-minority status communities (where 15 percent or more of the population are people of color) comprise just 5.4 percent of all communities in the state, they are home to 18.2 percent of all active power plants and 23.4 percent of all proposed power plants in the state. Likewise, while lower-income communities (where the median household income is $39,999 or less) comprise 50.8 percent of all towns in the state, they are home to 65.6 percent of all active power plants and 63 percent of all proposed power plants. In addition, the four dirtiest power plants in the state – the Brayton Point, Salem Harbor, Mount Tom, and Mystic plants – are all located in low to moderately-low-income communities (the Mount Tom power plant is located in the low-income/ high-minority status community of Holyoke). Along with the Canal power plant in Sandwich, these plants are the largest industrial sources of greenhouse gasses in the state. Clearly, working class communities are disproportionately burdened by the some of the worst polluting power plants in all of New England.

(5) **Unequal Exposure to Incinerators:** There are nine municipal solid waste combustors (MSWCs) in operation in Massachusetts, which combust approximately 3.3 million tons of trash each year. Incinerators are implicated in causing massive water and air pollution and related public health problems, and emit more mercury (6,040 pounds) than any other source in the state. Six of these nine incinerators are located in low and medium-low income communities, where the average medium household income is $39,999 or less. Only one of the nine incinerators is located in a high-income community, where the average median household income is $50,000 or greater. Thus, *lower-income communities ($39,999 or less) have twice the number of incinerators as higher-income communities ($40,000 or more).* But while class considerations seem to be of some importance in the siting of these facilities, only one of the nine incinerators is located in a higher-minority status community (where 15% or more of the population are people of color). In fact, this is one of the few hazardous facilities in the Commonwealth where there does not appear to be a racial bias.

(6) **Unequal Exposure to Cumulative Environmental Hazards:** Many past studies on the disproportionate exposure of low-income communities and communities of color have focused on a single type of hazardous facility or waste site. This study provides a cumulative method for measuring community exposure rates to all the types of environmentally hazardous facilities and sites listed above. This is accomplished by assigning a point system which weighs the average risks of various hazardous facilities and sites. These points are totaled for each community and then divided by total area to arrive at an exposure rate.

According to this cumulative measure, communities of low-minority status (where less

than 5% of the population are people of color) average only 6.4 points per square mile, compared to 57 points per square mile for communities of high-minority status (where 25% of the population or more are people of color). In other words, *communities of high-minority status face a cumulative exposure rate to environmentally hazardous facilities and sites of all types which is nearly nine times greater than communities of low-minority status.* In fact, there is a consistently sharp increase in the cumulative exposure rate to these hazardous facilities/sites which directly corresponds to increases in the size of the minority population in all communities. Without question, *it would appear that communities of color are greatly overburdened in comparison with communities of low-minority status, and are unequally exposed to environmental hazards of almost every kind.*

Likewise, low-income communities (where the median household income is $29,999 or less) average an exposure rate of 27.9 points per square mile. This rate stands in dramatic contrast to the exposure rates for all other higher-income communities (where the average median household income is $30,000 or greater), which ranges from 6.9 to 8.9 points per square mile. As a result, *low-income communities face a cumulative exposure rate to environmentally hazardous facilities and sites of all types which is 3.13 to 4.04 times greater than all other communities (measured by income) in the state.* As is the case with communities of color, *low-income communities are disproportionately exposed to environmental hazards of all kinds. Ecological racism and class-based environmental injustices appear to be profound in the Commonwealth of Massachusetts.*

Given these disparities, it is almost inevitable that people of color and working-class whites are exposed to significantly greater environmental risks than are wealthier, predominantly white communities in the Commonwealth. Further research is required to deepen our understanding of the role played by racism and class-based discrimination in creating these disparities, particularly in reference to the siting of environmental risks, the promulgation of environmental laws and regulations, the enforcement of environmental laws, and the attention given to the cleanup of polluted areas.[2] Clearly, there is a complex interplay of systemic economic forces and institutionalized rules, regulations, and policies of government and corporate decisions-makers that result in lower-income neighborhoods and communities of color being targeted for the least desirable land uses, resulting in the disproportionate exposure to environmentally hazardous sites and facilities. To overcome the forms of environmental racism and class-based ecological inequalities documented in this report, it is essential that people of color and working families gain greater inclusion into the decision-making processes affecting their communities. In addition, governmental policy-makers and Department of Environmental Protection personnel need additional resources and tools to begin effectively addressing these issues.

Massachusetts already has an Areas of Critical Environmental Concern (ACE) law, which

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[2] See Luke W. Cole, "Empowerment as the Key to Environmental Protection: The Need for Environmental Poverty Law," *Ecology Law Quarterly*, Vol.19 (1992: 619-630).

protects natural resources from pollution. Given the disproportionate exposure of lower-income communities and communities of color to ecological hazards, however, further protections are needed. We recommend that adoption of an Environmental Justice Designation Bill which would direct state environmental officials to designate overburdened communities as Areas of Critical Environmental Justice Concern (ACEJC).

The following sections of this report provide a more elaborate presentation of our findings, as well as in-depth discussion and analysis of the current environmental injustices plaguing lower-income communities and communities of color in the Commonwealth of Massachusetts.

Unequal Exposure to Hazardous Waste Sites

In thousands of communities across the United States, billions of gallons of highly toxic chemicals including mercury, dioxin, PCBs, arsenic, lead, and heavy metals such as chromium have been dumped in the midst of unsuspecting neighborhoods. These sites poison the land, contaminate drinking water, and potentially cause cancer, birth defects, nerve and liver damage, and other health effects. The worst of these are called National Priority List (NPL) or Superfund sites, named after the 1980 law to clean up the nation's most dangerous toxic dumps. In a 1991 study, the National Research Council found that there were over 41 million people who lived within four miles of at least one of the nation's over 1,500 dangerous Superfund waste sites.[3] It is estimated that groundwater contamination is a problem at over 85 percent of the nation's Superfund sites -- a particularly alarming statistic when we realize that over 50 percent of the American people rely upon groundwater sources for drinking. Although these dumps are the worst of the worst, the Office of Technology Assessment recently estimated that there are as many as 439,000 other illegal hazardous waste sites in the country. [4]

In Massachusetts, there are 32 Sites on the EPA's National Priorities List, located [totally or partially] in 42 towns. The *Fort Devens Site* encompasses the towns of Ayer, Shirley, Lancaster, Harvard. The *Ford Devens-Sudbury Training Annex Site* encompasses the towns of Sudbury, Maynard, Hudson, and Stow. The *Hanscom Field/Hanscom Air Force Base Site* encompasses Bedford, Concord, Lexington, and Lincoln. The *Otis Air National Guard/Camp Edwards Site* encompasses Falmouth, Bourne, Sandwich, and Mashpee. The *South Weymouth Naval Air Station Site* encompasses Weymouth, Abington, and Rockland. The *W.R. Grace & Company, Inc., Site* encompasses Acton and Concord. The remaining 26 sites are located in

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[3] See National Research Council, *Environmental Epidemiology: Public Health and Hazardous Wastes* (Washington, DC: National Academy Press, 1991).

[4] For a review, see Environmental Research Foundation, *Rachel's Hazardous Waste News*, No.332, April 8, 1993, pp.1-2.

single towns.[5] These towns are home to more than 1,072,017 residents, including 70,491 people of color. Approximately 61,000 people alone live within a 3-mile radius of the Iron Horse Park Superfund site in North Billerica. In addition to these Superfund sites, there are over 21,000 state Department of Environmental Protection (DEP) hazardous waste sites in the Commonwealth. Some 3,389 of these sites (which includes EPA Superfund sites) are considered serious.

For residents living near Superfund and other major toxic waste sites, the National Research Council also found a disturbing pattern of elevated health problems, including heart disease, spontaneous abortions and genital malformations, and death rates, while infants and children are found to suffer a higher incidence of cardiac abnormalities, leukemia, kidney-urinary tract infections, seizures, learning disabilities, hyperactivity, skin disorders, reduced weight, central nervous system damage, and Hodgkin's disease.[6] Exposure to industrial chemicals is also believed by scientists to be contributing to the dramatic increases since the 1950s in cancer of the testis, prostate gland, kidney, breast, skin, and lung, as well as malignant myeloma, non-Hodgkin's lymphoma, and numerous childhood cancers.[7] -- a cancer epidemic that kills half-a-million Americans each year. In fact, cancer now kills more American children than any other single disease for the first time in history. In Massachusetts, elevated rates of leukemia (especially among children) has been linked to the industrial chemical trichloroethylene found in the town of Woburn's drinking water, as well as tetrachloroethylene in drinking water on the Upper Cape.[8] Massachusetts now has one of the highest rates of breast cancer in the country --

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[5] United States Environmental Protection Agency, Superfund Remedial Sites, National Priorities List, April 11, 2000.

[6] Numerous other studies have documented similar health impacts as the NRC report. See Dean B. Baker, et.al., "A Health Study of Two Communities [sic] Near the Stringfellow Waste Disposal Site," *Archives of Environmental Health*, Vol.43 (Sept./Oct., 1988: 325-334); Sandra A. Geschwind, et.al., "Risk of Congenital Malformations Associated with Proximity to Hazardous Waste Sites," *American Journal of Epidemiology*, vol.135 (1992: 1197-1207); Stanley J. Goldberg, "An Association of Human Congenital Cardiac Malformations and Drinking Water Contaminants," *Journal of the American College of Cardiology*, Vol.16, No.1 (July, 1990: 155-164); Robert Hoover and Joseph F. Fraumeni, Jr., "Cancer Mortality in U.S. Counties with Chemical Industries," *Environmental Research*, Vol.9 (1975: 196-207); Beverly Paigen, et.al., "Prevalence of health Problems in Children Living Near Love Canal," *Hazardous Waste & Hazardous Materials*, Vol.2, No.1 (1985: 23-43); and J.B. Andelman and D.W. Underhill, (eds.), *Health Effects from Hazardous Waste Sites* (Chelsea, MI: Lewis, 1987)..

[7] For a discussion of the environmental impacts on cancer rates, see Eric J. Krieg, "Toxic Wastes, Race, and Class: A Historical Interpretation of Greater Boston" (Ph.D. Dissertation, Northeastern University, 1995), pp.1-26; Sandra Steingraber, *Living Downstream: An Ecologist Looks at Cancer and the Environment* (New York: Addison-Wesley, 1997); and Richard W. Clapp, "The Decline in U.S. Cancer Mortality From 1991-1995: What's Behind the Numbers?," *New Solutions: A Journal of Environmental and Occupational Health Policy*, Vol.7, No.4 (Summer 1997: 30-34).

[8] See J.J. Cutler, G.S. Parker, S. Rosen, B. Prenney, R. Healey, and G.G. Caldwell, "Childhood Leukemia in Woburn, Massachusetts," *Public Health Reports*, Vol.101, No.2 (1986: 201-205); S.W. Lagakos, B.J. Wessen, and M. Zelen, "An Analysis of Contaminated Well Water and Health Effects in Woburn, Massachusets," *Journal of the American Statistical Association*, Vol.81 (1986: 583-614); and Ann Aschengrau, David Ozonoff, Chris Paulu,

some 4,400 women are diagnosed and 1,000 women die each year. Women living on Cape Cod are particular vulnerable, having a 20 percent higher rate of breast cancer than women living elsewhere in the state.[9]

As is evident from the proliferation of toxic waste sites, many current policy initiatives are actually intensifying problems they were designed to cure. Most environmental laws require businesses to *contain* pollution sources for more proper treatment and disposal (in contrast to the previous practice of dumping onsite or into nearby commons). Once the pollution is "trapped," the manufacturing industry pays the state or a private company for its treatment and disposal. The waste, now commodified, becomes mobile, crossing local, state, and even national borders in search of "efficient" (i.e., low-cost and politically feasible) areas for treatment, incineration, and/or disposal. More often than not, the waste sites and facilities are themselves hazardous and located in poor working class neighborhoods and communities of color.[10] In this respect, an environmental issue impacting the general population has been addressed in a manner which displaces the problem in a new form onto more politically marginalized sectors of the population.

Hazardous waste sites nationwide are among the more concentrated environmental hazards confronting low income neighborhoods and communities of color. According to a 1987 report by the United Church of Christ's Commission on Racial Justice, three out of five African Americans and Latinos nationwide live in communities that have illegal or abandoned toxic dumps. Communities with one hazardous waste facility have twice the percentage of people of color as those with none, while the percentage triples in communities with two or most waste sites.[11] A subsequent follow-up study conducted in 1994 has now found the risks for people of

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Patricia Coogan, R. Vezina, Timothy Heeren, and Yuqing Zhang, "Cancer Risk and Tetrachloroethylene-Contaminated Drinking Water in Massachusetts," *Archives of Environmental Health*, Vol.48, No.5 (1993: 284-292).

[9] The Silent Spring Institute is conducting an extensive investigation of the possible environmental causes of the breast cancer epidemic on Cape Cod. See *The Cape Code Breast Cancer and Environment Study: Results of the First Three Years of Study* (Newton: Silent Spring Institute, 1998).

[10] For studies which examine the inequitable distribution of hazardous waste facilities in specific regions of the country, see Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* (Boulder, CO: Westview Press, 1990); Robert D. Bullard, (ed.), *Unequal Protection: Environmental Justice and Communities of Color* (San Francisco: Sierra Club Books, 1994); Bunyan Bryant and Paul Mohai, (eds.), *Race and the Incidence of Environmental Hazards: A Time for Discourse* (Boulder, CO: Westview Press, 1992); and Daniel R. Faber, (ed.), *The Struggle for Ecological Democracy: Environmental Justice Movements in the United States* (New York: Guilford Press, 1998).

[11] See Benjamin F. Chavis, Jr., and Charles Lee, *Toxic Wastes and Race in the United States: A National Report on the Racial and Socioeconomic Characteristics of Communities Surrounding Hazardous Waste Sites* (New York: United Church of Christ Commission for Racial Justice, 1987). This study analyzed data on the number and type of hazardous waste facilities in the approximately 35,5000 residential zip codes of the United States, along with data on percent minority population, mean household income, mean home value, number of uncontrolled toxic waste sites per 1000 persons, and pounds of hazardous waste generated per person.

color to be even greater than in 1980, as they are 47 percent more likely than whites to live near these potentially health-threatening facilities.[12] In short, race and poverty are the two most critical demographic factors for determining where commercial hazardous waste facilities are located in the United States (including hazardous waste generators of all sizes across the Commonwealth of Massachusetts).[13] That the "disempowered" of American society should serve as the dumping ground for American business is often blatantly stated by industry itself. A 1984 report by Cerrell Associates for the California Waste Management Board, for instance, openly recommended that polluting industries and the state locate hazardous waste facilities in "lower socio-economic neighborhoods" because those communities had a much lower likelihood of offering political opposition.[14]

Federal governmental enforcement actions also appear to be uneven with regard to the class and racial composition of the impacted community. According to a 1992 nationwide study which appeared in the *National Law Journal*, Superfund toxic waste sites in communities of color are likely to be cleaned 12 to 42 percent *later* than sites in white communities. Communities of color also witness government penalties for violations of hazardous waste laws which are on average only one-sixth ($55,318) of the average penalty in predominantly white communities ($335,566). The study also concluded that it takes an average of 20 percent longer for the government to place toxic waste dumps in minority communities on the National Priorities List (NPL), or Superfund list, for cleanup than sites in white areas.[15]

In Massachusetts, there are currently over 21,038 hazardous waste sites, including 3,389 more serious Tier I-II sites, according to March 2000 DEP data. As required under the Massachusetts Contingency Plan, hazardous waste sites must be ranked according to the severity of their risk to human health and the environment. The DEP has developed a tier classification system for determining the danger level of a hazardous waste site to the public health and the environment. Sites can be classified as Tier IA, IB, IC or II, with Tier IA sites requiring the most stringent oversight and Tier II the least. A *Numerical Ranking Sheet* (NRS) is used to calculate the numerous ecological and public health factors which determine a site's classification. The

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[12] See Benjamin Goldman and L. Fitton, *Toxic Waste and Race Revisited: An Update of the 1987 Report on the Racial and Socioeconomic Characteristics of Communities with Hazardous Waste Sites* (Washington, DC: Center for Alternatives, the National Association for the Advancement of Colored People, and the United Church of Christ Commission for Racial Justice, 1994).

[13] See Lisa Spence, *Race, Class, and Environmental Hazards: A Study of Socio-Economic Association with Hazardous Waste Generators and Treatment/Storage/Disposal Facilities in Massachusetts* (Master's Thesis, Civil and Environmental Engineering, Tufts University, Medford, MA, 1995).

[14] See Julie Roque, "Review of EPA Report: 'Environmental Equity: Reducing Risk for All Communities'," *Environment*, Vol.35, No.5 (June 1993: 25-28).

[15] See Marianne Lavelle and Marcia Coyle, "Unequal Protection: The Racial Divide in Environmental Law," *National Law Journal*, September 21, 1992, pp.2-12.

NRS contains five main sections:[16]

(1) Exposure Pathways evaluate the ways a person can be exposed to toxics, specifically the soil, groundwater, surface water, and air;
(2) Disposal Site Characteristics evaluate the toxicity of the released material(s);
(3) Human Population and Land Uses evaluate the potential risks based on nearby population and land and water uses;
(4) Ecological Population evaluates the potential risks posed to the environment based on the site's proximity to sensitive areas, such as wetlands and endangered species;
(5) Mitigating Disposal Site Specific Conditions take into account conditions at the site not factored into the NRS.

One of the primary reasons the DEP ranks a large number of the most serious Tier I sites in the suburban versus urban areas such as Boston are related to drinking water issues. The presence of a hazardous waste site in a larger urban area where the drinking water is transported from a distant reservoir may not pose the same threat as in a suburban/rural community dependent upon local groundwater sources.

As indicated in Table I on "Class-Based Disparities in the Location of Hazardous Waste Sites" (see following page), there appears to be a significant concentration of such sites in lower-income communities.

In Massachusetts, low-income communities, where the average household medium income is $29,999 or less, contain an average of 120.9 DEP hazardous waste sites. In contrast, communities where the average income is $30,000 or greater, contain an average 41.9 to 50.2 hazardous waste sites. As a result, *low-income communities average roughly two-to-three times more DEP hazardous waste sites than higher-income communities.*

However, if lower-income communities are typically larger in size, one would expect to find a higher number of such sites. To control for the size of the community, it is useful to calculate the number of sites per square mile in order to obtain a more accurate exposure rate. When this is done, we find an even more pronounced class bias. In low-income communities, where the average household median income is $29,999 or less, there is an average of nearly 14 DEP hazardous waste sites per square mile. In contrast, higher-income status communities, where the household median income is $30,000 or greater, average 3.1 to 4.1 hazardous waste sites per square mile. As a result, low-income communities have about *three-and-a-half to almost four times* the number of hazardous waste sites per square mile as higher-income communities. These figures remain relatively consistent with comparisons of the more serious

[16] For a discussion, see Eric Weltman, *A Citizen's Guide to the State Superfund: Understanding the Massachusetts Contingency Plan* (Boston: Massachusetts Campaign to Clean Up Hazardous Waste, February 1996).

Tier I-II hazardous waste sites. In short, low-income communities in Massachusetts experience a far more profound exposure rate to DEP hazardous waste sites than higher-income communities.

Table 1: Class-Based Disparities in the Location of Hazardous Waste Sites

Median Household Income 1990 U.S. Census N=Number of Towns (Percent of all Towns)		Number of DEP Hazardous Waste Sites	Number of DEP Tier I-II Hazardous Waste Sites	Number of Towns with EPA Superfund Sites	Average Number of DEP Hazardous Waste Sites per Town	Average Number of DEP Hazardous Waste Sites per Square Mile
$0 to 29,999 (Low) N=50 (13.6)	Count	6,044	987	5	120.9	13.9
	Percent	(28.7)	(29.1)	(10.4)		
	Mean	120.9	19.7	.10		
$30,000 to 39,999 (Med. - Low) N=137 (37.2)	Count	6,863	1,101	14	50.1	4.1
	Percent	(32.6)	(32.5)	(29.2)		
	Mean	50.1	8.0	.10		
$40,000to 49,999 (Med. - High) N=114 (31.0)	Count	4,771	742	17	41.9	3.1
	Percent	(22.7)	(21.9)	(35.4)		
	Mean	41.9	6.5	.15		
$50,000 and greater (High) N=67 (18.2)	Count	3,360	559	12	50.2	3.2
	Percent	(16.0)	(16.5)	(25.0)		
	Mean	50.2	8.3	.18		
Totals N=368 (100%)		21,038 (100%)	3,389 (100%)	48 (100%)	63.3	5.0

** Information on all hazardous waste sites was provided by the Massachusetts Department of Environmental Protection (DEP) and U.S. Environmental Protection Agency (EPA) databases in March, 2000. All DEP waste site information provided above includes EPA Superfund sites as part of the count.

These disparities seem repeated for communities of color. In Massachusetts, low-minority status communities, where less than 5% of the population is made up of people of color, average 41.2 DEP hazardous waste sites. In contrast, high minority status communities, where 25% or more of the population is made up of people of color, average 162.5 sites. Communities of moderately-high minority status, where 15 to 24.99% of the population is made up of people of color, average nearly 190 sites. As a result, *higher minority status communities, where 15% or more of the population is made up of people of color, average well over four times as many DEP hazardous waste sites as low-minority status communities.*

Table 2: Racial Disparities in the Location of Hazardous Waste Sites

Non-White Population 1990 U.S. Census N=Number of Towns (Percent of all Towns)		Number of DEP Hazardous Waste Sites	Number of DEP Tier I-II Hazardous Waste Sites	Number of Towns with EPA Superfund Sites	Average Number of DEP Hazardous Waste Sites per Town	Average Number of DEP Hazardous Waste Sites per Square Mile
Less than 5% (Low) N=299 (81.3)	Count	12,324	1,969	29	41.2	2.9
	Percent	(58.6)	(58.1)	(60.4)		
	Mean	41.2	6.6	.10		
5 to 14.99% (Low - Moderate) N=49 (13.3)	Count	5,219	849	16	106.5	9.0
	Percent	(24.8)	(25.1)	(33.3)		
	Mean	106.5	17.3	.33		
15 to 24.99% (Moderate - High) N=9 (2.4)	Count	1,708	257	3	189.8	23.4
	Percent	(8.1)	(7.6)	(6.3)		
	Mean	189.8	28.6	.33		
25% and greater (High) N=11 (3.0)	Count	1,787	314	0	162.5	27.2
	Percent	(8.5)	(9.3)	(0.0)		
	Mean	162.5	28.6	0.00		
Totals N=368 (100%)		21,038 (100%)	3,389 (100%)	48 (100%)	63.3	5.0

** Information on all hazardous waste sites was provided by the Massachusetts Department of Environmental Protection (DEP) and U.S. Environmental Protection Agency (EPA) databases in March, 2000. All DEP waste site information provided above includes EPA Superfund sites as part of the count.

To control for the size of the community, it is useful to calculate the number of sites per square mile in order to obtain a more accurate exposure rate. When this is done, we find an even more pronounced racial bias. In high minority status communities, where 25% or more of the population is made up of people of color, there is an average of 27.2 DEP hazardous waste sites per square mile. In contrast, low-minority status communities, where less than 5% of the population is made up of people of color, there is an average of 2.9 hazardous waste sites per square mile. As a result, *high-minority status communities have more than nine times the number of hazardous waste sites per square mile than low-minority status communities.* These figures remain consistent with comparisons of the more serious Tier I-II hazardous waste sites. In short, *communities of color experience a far more profound exposure rate to DEP hazardous waste sites than predominantly white communities, indicating that racial bias appears to be a significant factor in determining the location of Tier and Non-Tier Hazardous waste sites in the Commonwealth of Massachusetts.*

Only in the case of EPA Superfund sites do the class and racial biases associated with DEP hazardous waste sites disappear, a factor related to the high number of Superfund sites on military facilities located in rural and suburban locales near more affluent communities, particularly on Cape Cod. There are also at least 47 Tier IA sites in Bourne resulting from contamination from the Massachusetts Military Reservation.

Unequal Exposure to Landfills

Landfills can also pose hazards to communities. Seven former Massachusetts landfills are now federal Superfund sites, and even newer ones, which are lined with plastic, will eventually leak, and could threaten underground water supplies. The table below provides data on seven different types of landfills and related facilities: incinerator ash landfills; demolition landfills; illegal sites; sludge landfills; tire piles; municipal solid waste landfills (garbage dumps); and trash transfer stations. Of these sites, incinerator ash landfills are typically most hazardous, as fly ash wastes produced by incinerators and power plants contain concentrated levels of heavy metals like arsenic, lead and cadmium, radioactive elements, cancer causing organic compounds, and other contaminants.

There are a total of 954 different landfill-types in the Commonwealth, of which the majority (566) are garbage dumps. As outlined in the Tables 3-4 (see following page), the state's landfills and trash transfer stations are relatively more heavily concentrated in lower-income communities and communities of color. In comparison to low-minority status communities (where less than 5 percent of the population are people of color), which average .13 of all landfill types per square mile, high-minority status communities (where 25 percent or more of the community are people of color) average .36 of these facilities per square mile, *a rate nearly three times higher*. In low-income communities (where the median household income is less than $30,000), there are .18 of these landfill-types per square mile, a figure slightly higher than the .13-.15 rates for higher-income communities. However, when municipal solid waste landfills are excluded in a closer inspection of the data, it is clear the lower-income communities ($39,999 or lower) have a much high proportion of every other type of landfill than higher-income communities ($40,000 or higher). For instance, while lower-income communities ($39,999 or lower) make up 50.8 percent of all towns in the state, they are home to 58.9 percent of all incinerator ash landfills, 66.7 percent of all demolition landfills, 71.4 percent of all illegal sites, 74.5 percent of all sludge landfills, 69.5 percent of all tire piles, and 58.9 percent of all transfer stations. Clearly, racial and class biases are both present in determining the location of all landfill-types (with the exception of garbage dumps) on a community-basis.

Table 3: Class-Based Disparities in the Siting of All Landfill-Types

Median Household Income 1990 U.S. Census N=Number of Towns (Percent of all Towns)		Number of Incinerator Ash Landfills	Number of Demolition Landfills	Number of Illegal Sites	Number of Sludge Landfills	Number of Tire Piles	Number of Municipal Solid Waste Landfills	Number of Transfer Stations	Average Number of all Landfill - Types per Town	Average Number of all Landfill-Types per Square Mile
$0 to 29,999 (Low) N=50 (13.6)	Count	2 (11.8)	8 (20.5)	7 (33.3)	12 (20.3)	5 (21.7)	69 (12.2)	33 (14.4)	2.9	.18
	Percent									
$30,000 to 39,999 (Med. - Low) N=137 (37.2)	Count	8 (47.1)	18 (46.2)	8 (38.1)	32 (54.2)	11 (47.8)	203 (35.9)	102 (44.5)	2.8	.13
	Percent									
$40,000to 49,999 (Med. - High) N=114 (31.0)	Count	7 (41.2)	9 (23.1)	5 (23.8)	12 (20.3)	5 (21.7)	185 (32.7)	62 (27.1)	2.5	.15
	Percent									
$50,000 and greater (High) N=67 (18.2)	Count	0 (0.0)	4 (10.3)	1 (4.1)	3 (5.1)	2 (8.7)	109 (19.3)	32 (14.0)	2.3	.14
	Percent									
Totals N=368 (100%)		17 (100%	39 (100%)	21 (100%)	59 (100%)	23 (100%)	566 (100%)	229 (100%)	2.6	.15

** Information on all landfills was provided by the Massachusetts Department of Environmental Protection (DEP) databases in April, 2000.

Table 4: Racial Disparities in the Siting of All Landfill-Types

Non-White Population 1990 U.S. Census N=Number of Towns (Percent of all Towns)		Number of Incinerator Ash Landfills	Number of Demolition Landfills	Number of Illegal Sites	Number of Sludge Landfills	Number of Tire Piles	Number of Municipal Solid Waste Landfills	Number of Transfer Stations	Average Number of all Landfill-Types per Town	Average Number of all Landfill-Types per Square Mile
Less than 5% (Low) N=299 (81.3)	Count	11 (64.7)	30 (76.9)	14 (66.7)	50 (84.7)	21 (91.3)	445 (78.6)	180 (78.6)	2.5	.13
	Percent									
5 to 14.99% (Low - Moderate) N=49 (13.3)	Count	5 (29.4)	4 (10.3)	3 (14.3)	5 (8.5)	2 (8.7)	92 (16.3)	35 (15.3)	3.0	.16
	Percent									
15 to 24.99% (Moderate - High) N=9 (2.4)	Count	0 (0.0)	3 (7.7)	0 (0.0)	4 (6.8)	0 (0.0)	17 (3.0)	8 (3.5)	3.6	.30
	Percent									
25% and greater (High) N=11 (3.0)	Count	1 (5.9)	2 (5.1)	4 (19.0)	0 (0.0)	0 (0.0)	12 (2.1)	6 (2.6)	3.1	.36
	Percent									
Totals N=368 (100%)		17 (100%)	39 (100%)	21 (100%)	59 (100%)	23 (100%)	566 (100%)	229 (100%)	2.6	.15

** Information on all landfills was provided by the Massachusetts Department of Environmental Protection (DEP) databases in April, 2000.

Unequal Exposure to Polluting Industrial Facilities

American industry produces enormous quantities of pollution and toxic waste each year. According to the EPA's Toxic Release Inventory (TRI) for 1998 -- the latest year available -- some 23,000 facilities reported a total of 7.3 billion pounds of chemical pollutants released into the nation's air, water, land, and underground. The vast majority of these pollutants – some 93.9 percent (or 6.9 billion pounds) – were released into the environment directly on-site.[17] Thus, citizens who work and reside in the communities in which these facilities are located typically bear much greater exposure rates to industrial pollutants.[18]

Exposure to industrial pollution -- especially air pollution -- is proving deadly to tens of thousands of citizens. Human exposure to hazardous air pollutants (HAPs) can result in both serious acute and chronic health effects. Short-term, acute effects can include eye irritation, nausea, difficulty breathing, asthma, or even death. Long-term, chronic effects include damage to the respiratory or nervous systems, birth defects and damage to reproductive systems, neurological disorders, as well as cancer. Aggravated by the exhaust from over two-hundred million motor vehicles (particularly in larger metropolitan areas), industrial air pollution kills over 60,000 Americans each year. Half a million people living in the most polluted areas in 151 cities across the country face a risk of death which is some 15 to 17 percent higher than in the least polluted areas. [19] Some 164 million Americans are now at risk for respiratory and other health problems from exposure to excessive air pollution.[20]

In Massachusetts, poor air quality poses a serious threat to public health. According to data provided by the EPA's Cumulative Exposure Project (CEP), every county in Massachusetts has levels of key air-borne toxic chemicals in the form of volatile organic compounds (VOCs)

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[17] Of these on-site releases, 62.8 percent were to land, 29.9 percent were to air, 3.9 percent were to underground injection, and 3.4 percent were to surface water. There are now nearly 650 toxic chemicals and chemical compounds on the list of chemicals that must be reported to EPA and the States under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), which established the TRI program.

[18] The 1998 Toxic Release Inventory data and background information on the TRI program are available at http://www.epa.gov/tri/tri98/

[19] A study conducted by researchers at the Harvard School of Public Health, Brigham Young University, and the American Cancer Society, which was released on March 10, 1995, and appeared in the *American Journal of Respiratory and Critical Care Medicine*, estimated some 60,000 annual air pollution deaths. Another study by the Natural Resources Defense Council (NRDC) released on May 8, 1996, which analyzed air quality in 239 cities across the country, estimated some 64,000 Americans to be dying each year from air pollution, even at levels which the federal government considers to be safe.

[20] According to a 1993 report by the American Lung Association, some 66 percent of U.S. citizens live in areas that violate standards for ozone (which causes lung tissue to become inflamed and impedes breathing); carbon dioxide (which impedes the blood's ability to carry oxygen to the heart); and lead (which causes brain and organ damage). Because their lungs are particularly sensitive, at highest risk are the 31 million children and 19 million elderly who live in these polluted areas.

that exceed health-based state levels. There are at least 16 toxic compounds which exceed the acceptable levels of concentration set by both federal regulatory agencies and the MA Allowable Ambient Limits (AAL) of the Department of Environmental Protection (DEP).[21] For instance, concentrations of benzene, 1,3-butadiene, formaldehyde and acrolein -- chemicals which are known to cause numerous adverse health effects, including neurological disorders, birth defects, reproductive disorders and respiratory diseases -- exceed the AAL health-based risk standards in all counties *by up to 80 times*. As a result, the Massachusetts Public Interest Research Group (MASSPIRG) estimates that air pollution annually kills at least 1,000 people in the state. Another three quarters of a million Massachusetts residents are put at risk each summer from high smog levels, which is particularly harmful to children, the elderly, and those with respiratory problems. Some 8,000 of these people will end up in the hospital, and over 24,000 will visit emergency rooms. Cancer rates in the state currently exceed the national average, and toxic air pollutants are believed to be a major contributor to the problem. The Natural Resources Defense Council (NRDC) estimates that nearly 1,500 people die prematurely every year in the New England region from problems aggravated by air pollution.[22]

In recent years a number of studies have been conducted on the unequal exposure to air pollution and other environmental hazards. The findings of these studies point to a consistent pattern of environmental racism and class-based ecological injustices.[23] Within America's urban areas, for instance, lower-income people (particularly those living below the poverty level) are found to be more greatly exposed to combined concentrations of air pollutants than higher-income populations. Similarly, people of color are consistently exposed to significantly more air pollution nationwide than whites (with the race gap being wider and more consistent than the income gap).[24] According to the EPA, 57 percent of all whites nationwide live in areas with poor

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[21] In Massachusetts, *mobile sources* (primarily motor vehicles) are responsible for 42 percent of the total HAP emissions in the state. *Area Sources*, which are smaller air sources that release less than 10 tons per year of any individual HAP and less than 24 tons per year of combined HAPs, emit 51 percent of all HAPs in the state. Examples include gas stations, dry cleaners, and small print shops. *Point sources* are stationary facilities that emits (or has the potential to emit) 10 tons or more per year of any one of the listed HAPS, or 25 tons or more per year of combined HAPs, emit 7 percent of the total HAPs in the state. Examples of point sources include chemical plants, paper mills, power plants, and waste incinerators. See Michelle Toering and Rob Sargent, *Every Breath We Take: How Motor Vehicles Contribute to High Levels of Toxic Air Pollution in Massachusetts* (Boston: A Report for the MASSPIRG Education Fund, July 8th, 1999), pp.1-32.

[22] See Natural Resources Defense Council (NRDC), *Breathtaking: Premature Mortality Due to Particulate Air Pollution in 239 American Cities* (Washington D.C.: May 1996).

[23] For a concise summary of these studies, see Paul Mohai and Bunyan Bryant, "Demographic Studies Reveal a Pattern of Environmental Injustice," pp.10-24 in Jonathan S. Petrikin (ed.), *Environmental Justice* (San Diego: Greenhaven Press, 1995).

[24] See Michael Gelobter, "Toward a Model of 'Environmental Discrimination'," in Paul Mohai and Bunyan Bryant, (eds.), *Race and the Incidence of Environmental Hazards: A Time for Discourse* (Boulder, CO: Westview Press, 1992), pp.64-81; and L. Gianessi, H.M. Peskin, and E. Wolff, "The Distributional Effects of Uniform Air Pollution Policy in the U.S.," *Quarterly Journal of Economics* (May 1979: 281-301).

air quality, compared to 80 percent of all Latinos.[25] In Los Angeles, it is estimated that 71 percent of the city's African Americans and 50 percent of the Latinos live in what are categorized as the most polluted areas, compared to only 34 percent of whites.[26] Unequal exposure to air pollutants for lower-income families and people of color is further aggravated by substandard housing; inadequate health care; a lack of public parks and safe spaces; a lack of social services; and so forth.

In a previous study, Nancy Maxwell explored whether polluting industrial land uses were differentially distributed with respect to the racial (percent of minority population) and class (median family income and percent living in poverty) compositions of 351 cities and towns in Massachusetts. She also examined whether higher intensities of polluting land uses were associated with increased incidence of certain cancers. The study used demographic and land use data from three time points spanning the 35-year period from 1950-85, as well as historical data on industry.[27] The study sought to answer two questions: (1) are there inequities in the social distribution of polluting land uses across Massachusetts communities?; and (2) are higher intensities of polluting land uses associated with increased cancer in Massachusetts communities? This study found that traditional manufacturing industries (associated with the "old" economy) inequitably burdened lower-income, higher-poverty, and higher-minority populated communities. The results of the regression analyses of land use and cancer also suggested that higher intensities of total manufacturing and industrial/commercial land uses were associated with a higher incidence of lung cancer (and probably also bladder cancer and non-Hodgkin's lymphoma).[28]

A 1993 study of Essex, Hampden, Middlesex, Norfolk, Suffolk, and Worcester counties in Massachusetts between 1987 and 1992 utilizing Resource Conservation and Recovery Act (RCRA) found that the vast majority of people of color happen to be concentrated into the

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[25] See D.R. Wernete and L.A. Nieves, "Breathing Polluted Air: Minorities are Disproportionately Exposed," *EPA Journal*, March/April 1992, p.16.

[26] See Eric Mann, *L.A.'s Lethal Air: New Strategies for Policy, Organizing, and Action* (Los Angeles: Labor/Community Strategy Center, 1991).

[27] Demographic data came from the U.S. Census; land use data are from a series of statewide aerial surveys, supplemented by U.S. and Massachusetts Census of Manufactures data on manufacturing industry. Cancer incidence data from 1982-1990 came from the Massachusetts Cancer Registry. The cancers of concern, selected on the basis of confirmed or tentative links to agricultural or industrial chemicals, are non-Hodgkin's lymphoma (NHL), leukemia, multiple myeloma, soft tissue sarcoma, and cancers of the brain, stomach, prostate, bladder, kidney, lung, and breast. See Nancy Irwin Maxwell, "Land Use, Demographics, and Cancer Incidence in Massachusetts Communities," (Ph.D. Dissertation: Boston University School of Public Heath, 1996).

[28] The incidence of lung cancer was associated with industrial/commercial land use, but only in specific years which suggests that the high-tech industries disproportionately hosted by well-to-do suburbs do not carry the same lung cancer risk as traditional, high-air-pollution manufacturing.

counties where 82.7 percent of the state's *large quantity generators* (LQG) of toxic materials and all commercial hazardous waste *treatment, storage, and disposal* (TSD) facilities are located. However, a closer analysis of Suffolk County found that 13.2 percent of LQG/ TSD facilities were located in the most-minority communities (census block groups) and that 26.4 percent of the facilities were located in the most-white communities.[29] Thus, it did not appear that in Suffolk County LQG and TSD facilities were concentrated in minority communities. Likewise, the study also found that 34 percent of these facilities were located in the poorest communities (quartile of block groups) – with a median income of $21,615 or less – while 22.6 percent of facilities were found in the wealthiest communities with a median income of $37,452 or higher. Thus, in contrast to many national studies, the investigation concluded that minority communities in Massachusetts do not have a disproportionate share of facilities, suggesting that people of color are more likely to live near a RCRA facility because of their economic status. The study further found that in the six counties 62.7 percent of facilities in the most-minority areas were inspected while 54.9 percent of facilities in the most-white areas were inspected (block group level).[30] The study concluded that there did not appear to be much bias against inspecting facilities located in the most minority areas.[31]

In this section of the report, we summarize information from the state's Large Quantity Toxics Users who reported to the Massachusetts Toxics Use Reduction Act (TURA) Program from 1990-98 (1998 is the most recent year that TURA data is available).[32] As required under

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[29] One can argue that town are too large for detailed studies of environmental injustice. The size of town can potentially mask racial or economic heterogeneity within the town area. For instance, a town with a 10 percent minority population might be concentrated in a particular portion of the town – the same section of town where polluting industries and facilities may be concentrated. However, analysis at the town level would mask the concentration of hazards in minority neighborhoods.

[30] At the census tract level, 66.7 percent of facilities in the most-minority areas were inspected and 56.9 percent of facilities in the most white areas were inspected. See Michael G. Terner, *A Geographic Information System (GIS) Assisted Approach for Assessing Environmental Equity in the EPA RCRA Program's Site Inspection Selection Process* (Massachusetts Institute of Technology: Master's Thesis, Department of Urban Studies & Planning, May 1993), p. 63.

[31] EPA guidelines demand that each state inspect all land disposal and all commercial hazardous waste treatment, storage or disposal (TSD) facilities every year. Further, 50 percent of the full universe of TSDs in any state must be inspected every year. Thus, every two years, all TSDs should be inspected. Guidelines also require that 8 percent of all large quantity generators (LQGs) in each state must be inspected every year. Theoretically, every 13 years all LQGs will be inspected, at least once. The state has full discretion in selecting which 8 percent of LQG facilities should be inspected.

[32] There are some 520 *Large Quantity Toxics Users* who reported to the Massachusetts Toxics Use Reduction Program (TURA) during the 1998 calendar year (the latest year such data is currently available). These companies reported using over 1.184 billion pounds of chemicals (not including trade secret chemicals), of which over 132.6 million pounds were generated as waste byproduct. Of this byproduct, some 50.5 million pounds of toxic chemicals were transferred off site (for recycling, recovery, treatment or disposal), while another 12 million

TURA, manufacturers meeting certain thresholds must report to the public the quantity and types of toxic chemicals they use. A company must report under TURA if is annually manufactures, processes, or uses 10,000 pounds of toxic chemicals or more. These toxic chemicals pose a threat to nearby residents, workers, and the environment from potential accidents, emissions on-site into the immediate environment, worker handling, waste disposal, toxins in the product, and product disposal.

Between 1990-98, some 1,029 distinct TURA facilities – ranging from a high of 727 firms in 1991 to 520 in 1998 – utilized over 9.886 billion pounds of toxic chemicals in production (does not include quantities for chemicals considered trade secret). During this same time frame, these large industrial facilities produced some 370,163,204 pounds of chemical waste byproduct which was *transferred* off-site for recycling, recovery, treatment, and/or disposal. Another 164,385,598 pounds of toxic chemical waste byproduct was *released* on-site directly into the environment (discharged into the air, ground, underground, or adjacent bodies of water) of the communities in which they were located -- an amount equivalent to 2055 tractor-trailer trucks each loaded with 80,000 pounds of toxic waste.[33] With regard to these on-site releases to the environment, the Electric, Gas and Sanitary Services sector is the largest source of such releases under TURA. In 1998, the 28 firms in this sector accounted for 39% of all on-site releases, some 71% of which were hydrochloric acid. The Chemical and Allied Products sector, which represents a little over half of total statewide use, accounted for 13% of total on-site releases and 31% of offsite transfers.

As seen in Table 5 on "Class-Based Disparities in the Siting and Emission Levels of TURA Industrial Facilities" (see following page), low-income communities (average median household income of $29,999 or less) and moderately low-income communities (average median household income of $30-39,999) comprise 50.8 percent of all communities in Massachusetts, but are home to 66.2 percent of all TURA facilities and 85.6 percent of all chemicals used by TURA facilities between 1990-98. More importantly, *lower-income communities received 78.7 percent of all chemical emissions into the local environment by TURA facilities during this time.* While upper-income communities (average median household income above $40,000) represent

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pounds were released on-site directly into the environment (discharged into the air, ground, underground, or adjacent bodies of water). When trade secret data is incorporated into the 1998 TURA aggregate quantities, we find that: 1.380 billion pounds of chemicals were used by state industry; 137 million pounds were generated as byproduct; and 64 million pounds of this byproduct was either released on-site into the environment or transferred off-site.

[33] The Toxics Use Reduction Act (TURA) was enacted in 1989, and had a stated 10-year goal of reducing the generation of toxic waste by 50% from the base year of 1987 to 1997. From 1990, the first reporting year, to 1998, there was a 48% reduction production adjusted byproduct. Using the same adjustment method, TURA filers have been equally successful in reducing their releases of TRI reported on-site chemicals by 83% since 1990. See Massachusetts Department of Environmental Protection, Bureau of Waste Prevention, *1998 Toxics Use Reduction Information Release,* A Report Developed in Conjunction with the Office of Technical Assistance for Toxics Use Reduction, the Toxics Use Reduction Institute, and the Executive Office of Environmental Affair (Spring 2000: 1-34).

nearly half of all communities in the state (49.2%), they received only 33.8 percent of all TURA facilities, 14.4 percent of all chemicals used by TURA facilities, and 21.3 percent of all chemical emissions into the local environment from 1990-98.

Table 5: Class-Based Disparities in the Siting and Emission Levels of TURA Industrial Facilities (1990-98)

Median Household Income 1990 U.S. Census N=Number of Towns (Percent of all Towns)		TURA Total Chemical Emissions in lbs. (1990-1998)	TURA Total Chemical Transfers in lbs. (1990-1998)	TURA Total Chemical Use in lbs. (1990-1998)	Number of Distinct TURA Facilities (1990-1998)
$0 to 29,999 (Low) N=50 (13.6)	Count	46,645,477	101,318,279	4,476,070,293	317
	Percent	(28.4)	(27.4)	(45.3)	(30.8)
	Mean	932,910	2,026,366	89,521,406	6.3
$30,000 to 39,999 (Med. - Low) N=137 (37.2)	Count	82,734,924	188,923,288	3,981,354,062	364
	Percent	(50.3)	(51.0)	(40.3)	(35.4)
	Mean	603,905	1,379,002	29,060,979	2.7
$40,000to 49,999 (Med. - High) N=114 (31.0)	Count	18,357,199	53,110,764	734,856,631	201
	Percent	(11.2)	(14.3)	(7.4)	(19.5)
	Mean	161,028	465,884	6,446,111	1.8
$50,000 and greater (High) N=67 (18.2)	Count	16,647,998	26,810,873	693,992,469	147
	Percent	(10.1)	(7.2)	(7.0)	(14.3)
	Mean	248,478	400,162	10,358,097	2.2
Totals N=368 (100%)		164,385,598 (100%)	370,163,204 (100%)	9,886,273,455 (100%)	1,029 (100%)

In fact, as seen in Table 6 on "Class-Based Disparities in the Exposure Rate to TURA Industrial Facilities" (see following page), low-income communities (with average household median incomes $29,999 or less) average 6.3 TURA facilities per town, some 932, 910 total pounds of chemical emissions released into the environment per town, and some 73,061 total pounds of chemical emissions per every square mile of town space for 1990-98. This contrasts sharply in comparison to moderately-high income communities (average household median income of $40-49,999), which have an average of 1.8 TURA facilites per town, an average of

Table 7: Racial Disparities in the Siting and Emission Levels of TURA Industrial Facilities (1990-98)

Non-White Population 1990 U.S. Census N=Number of Towns (Percent of all Towns)		TURA Total Chemical Emissions in lbs. (1990-1998)	TURA Total Chemical Transfers in lbs. (1990-1998)	TURA Total Chemical Use in lbs. (1990-1998)	Number of Distinct TURA Facilities (1990-1998)
Less than 5% (Low) N=299 (81.3)	Count	102,730,053	219,844,801	5,051,993,299	601
	Percent	(62.5)	(59.4)	(51.1)	(58.4)
	Mean	343,579	735,267	16,896,299	2.0
5 to 14.99% (Low - Moderate) N=49 (13.3)	Count	39,036,778	114,887,155	1,885,264,731	264
	Percent	(23.7)	(31.0)	(19.1)	(25.7)
	Mean	796,669	2,344,636	38,474,790	5.4
15 to 24.99% (Moderate - High) N=9 (2.4)	Count	10,947,318	14,415,034	182,564,805	67
	Percent	(6.7)	(3.9)	(1.8)	(6.5)
	Mean	1,216,369	1,601,670	20,284,978	7.4
25% and greater (High) N=11 (3.0)	Count	11,671,449	21,016,214	2,766,450,620	97
	Percent	(7.1)	(5.7)	(28.0)	(9.4)
	Mean	1,061,041	1,910,565	251,495,511	8.8
Totals N=368 (100%)		164,385,598 (100%)	370,163,204 (100%)	9,886,273,455 (100%)	1,029 (100%)

From Table 8 on "Racial Disparities in the Exposure Rate to TURA Industrial Facilities" (see following page), it is also clear that high-minority status communities (where 25 percent of the population or more are people of color) average 8.8 TURA facilities and 1.1 TURA facilities per square mile, compared to an average of just 2 facilities and .12 facilities per square mile for low-minority status communities (where less than five percent of the population are people of color). *In short, high-minority status communities average over four times as many TURA industrial facilities and over nine times as many TURA industrial facilities per square mile as low-minority status communities in the Commonwealth.* Furthermore, higher-minority status communities (where 15 percent or more of the population are people of color) average 1,061,041 to 1,216,360 total pounds of chemical emissions from TURA industrial facilities and from 110,718 to 123,770 pounds of chemical emissions from TURA facilities per square mile for 1990-98, compared to just 342,579 pounds of total chemical emissions and 22,735 pounds of chemical emissions per square mile for low-minority status communities.

Table 8: Racial Disparities in the Exposure Rate to TURA Industrial Facilities (1990-98)

Non-White Population 1990 U.S. Census N=Number of Town (Percent of all Towns)	Average Number of TURA Facilities per Town (1990-98)	Average Number of TURA Facilities per Square Mile (1990-98)	Average Total TURA Chemical Emissions (lbs.) Per Town (1990-98)	Average Total TURA Chemical Emissions (lbs.) per Square Mile (1990-98)
Less than 5% (Low) N=299 (81.3)	2.0	.12	343,579	22,735
5 to 14.99% (Low-Moderate) N=49 (13.3)	5.4	.40	796,689	86,014
15 to 24.99% (Moderate-High) N=9 (2.4)	7.4	.75	1,216,369	123,770
25% and greater (High) N=11 (3.0)	8.8	1.1	1,061,041	110,718

Thus, *in comparison to low-minority status communities, higher-minority status communities average roughly 3 to 3.5 more times as many pounds of chemical emissions into the environment from local TURA facilities; and 4.86 to 5.44 more times as many pounds of chemical emissions per square mile. Thus, it would appear that the racial status of a community is once again a major determinant in the level of exposure to TURA industrial facilities and pollution. The data would seem to indicate that communities of color bear a greatly disproportionate burden of the pollution emitted by the types of facilities.*

Unequal Exposure to Power Plants

The electric power industry is one of the most polluting industries in New England and the entire country. In 1998, electric utilities generated 1.1 billion pounds in total toxic chemical emissions nationwide, according to EPA-TRI data. In fact, electric utilities' emissions of sulfuric acid and hydrochloric acid pushed them near the top of the toxic inventory in many states.[34] Power plants are also major contributors to the formation of smog. Smog, also called ground-level ozone, is formed when nitrogen oxides, emitted as a byproduct of burning fossil fuels at electric power plants and in automobiles, mix with volatile organic compounds in the presence of sunlight. Smog is a major trigger of asthma, increased lung inflammation, coughing, and emergency hospitalization due to respiratory distress. Therefore, the unhealthiest levels of smog are generally recorded during the summer. A recent nationwide study estimated that smog pollution in the summer of 1997 was responsible for more than 6 million asthma attacks, 159,000 emergency room visits and 53,000 hospitalizations. Nearly 1,500 people die prematurely every year in New England from problems aggravated by air pollution.[35] Power plants are also major contributors of gases that cause global warming and toxic mercury emissions which seriously threaten public health and environmental quality.

In Massachusetts, MASSPIRG estimates that air pollution kills at least 1,000 people each year. Each summer, three quarters of a million Massachusetts residents are put at risk from high smog levels. Some 8,000 of these people will end up in the hospital, and over 24,000 will visit emergency rooms. And air quality continues to deteriorate. During the summer of 1999, Massachusetts recorded 21 unhealthy air days, where the ozone level of those days surpassed the allowable limit set by the EPA. The people currently most vulnerable to the effects of breathing smoggy air are children, the elderly and people with asthma or other respiratory diseases. [36] Despite ongoing efforts to control smog and soot forming pollutants, not enough is being done to address the risk of developing cancer, or reproductive, developmental or neurological disorders due to chemical exposures in the air we breathe.

Coal and oil-burning power plants, specifically those plants built prior to 1977, are a major source of air pollution in the state. In fact, utilities in Massachusetts are responsible for over 60 percent of the state's soot-forming sulfur dioxide emissions, 15 percent of the state's smog-causing nitrogen oxide emissions and 30 percent of the state's heat-trapping carbon

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[34] For the first time, electric utilities and mining facilities were included in the Environmental Protection Agency's annual toxic inventory report, which reviewed seven industrial sectors. See "EPA names leading toxic polluters," *The Boston Globe* (Friday, May 12, 2000), p.A21.

[35] See Natural Resources Defense Council (NRDC), *Breathtaking: Premature Mortality Due to Particulate Air Pollution in 239 American Cities* (Washington D.C.: May 1996).

[36] See Becky Stanfield, Angie Farleigh and Gina Porreco, *Danger in the Air: Unhealthy Smog Days in 1999* (Washington, D.C.: A Report by the Clean Air Network and U.S. Public Interest Research Group Education Fund, January 2000), p.2.

dioxide emissions. Sulfur dioxide (So2) emissions are the main precursor to the creation of soot -- tiny particles of soot which penetrate deep into the throat and lungs (and causes an estimated 1,500 premature deaths each year in the northeastern region of the U.S., according to the American Lung Association). Fossil-fuel power plants are also responsible for more than 800 pounds of airborne mercury emissions every year. Mercury causes severe damage the neurological system and has developmental effects on fetuses and small children.[37] Mercury is so toxic as a mere one-third of a teaspoon is enough to render the fish of a 25 acre lake unsuitable for children and pregnant women to eat. As a result of a loophole in clean air laws, fourteen plants in New England are legally polluting at much higher levels than newer plants built since 1977. Under the 1970 and 1977 amended Clean Air Act, the oldest fossil-fuel power plants – those built before 1977 – are not required to meet the same emissions standards as newer, cleaner plants.[38]

As indicated in Table 9 on "Racial and Class-Based Disparities in the Siting of Power Plants" (see following page), the state's power plants are disproportionately located in communities of color and lower-income communities. Although higher-minority status communities (where 15 percent or more of the population are people of color) comprise just 5.4 percent of all communities in the state, they are home to 18.2 percent of all active power plants and 23.4 percent of all proposed power plants in the state. Likewise, while lower-income communities (where the median household income is less than $39,999 or less) comprise 50.8 percent of all towns in the state, they are home to 65.6 of all active power plants and 63 percent of all proposed power plants.

Five of the dirtiest power plants in the state – the Canal, Brayton Point, Salem Harbor, Mount Tom, and Mystic plants – are legally emitting at a rate that is from 2.9 to 4.0 times the emission rate of plants built after 1977. The five plants are responsible for 89 percent of sulfur dioxide emissions and 57 percent of nitrous oxide emissions from all stationary sources in Massachusetts (the Brayton Point plant is the largest, most polluting power plant in all of New England). In fact, these five plants are responsible for more than 50 percent of the power plant pollution in all of New England, producing more than 24 million tons of heat-trapping carbon dioxide emissions in 1998. And pollution rates from these power plants have been increasing

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[37] See Rob Sargent and Michelle Toering, *Dirty Power in the Northeast: A Report on the 1998 Emissions of the Northeast's Dirtiest Power Plants* (Boston: Campaign to Clean Up Polluting Power Plants, 1999).

[38] Older fossil-fuel power plants built during the 1940-60s create the vast majority of power plant air pollution. The 1970 Clean Air Act, amended in 1977 and 1990, electric industry lobbyists successfully persuaded Congress that older plants would soon be retired, and therefore should be exempt from strict, new emission standards. Instead, this loophole has allowed owners of older, more polluting plants exempted from the modern standards to make bigger profits and stay in operation longer vis-a-vis the more expensive, cleaner, and newer power plants.

Table 9: Racial and Class-Based Disparities in the Siting of Power Plants

Non-White Population 1990 U.S. Census N=Number of Towns (Percent of all Towns)		Number of DEP Active Power Plants (June 2000)	Number of DEP Proposed Power Plants (June 2000)	**Median Household Income** 1990 U.S. Census N=Number of Towns (Percent of all Towns)		Number of DEP Active Power Plants (June 2000)	Number of DEP Proposed Power Plants (June 2000)
Less than 5% (Low) N=299 (81.3)	Count	38 (69.1)	10 (58.8)	**$0 to 29,999 (Low)** N=50 (13.6)	Count	14 (25.5)	2 (11.8)
	Percent				Percent		
5 to 14.99% (Low - Moderate) N=49 (13.3)	Count	7 (12.7)	3 (17.6)	**$30,000 to 39,999 (Med. - Low)** N=137 (37.2)	Count	22 (40.0)	7 (41.2)
	Percent				Percent		
15 to 24.99% (Moderate - High) N=9 (2.4)	Count	7 (12.7)	3 (17.6)	**$40,000to 49,999 (Med. - High)** N=114 (31.0)	Count	16 (29.1)	7 (41.2)
	Percent				Percent		
25% and greater (High) N=11 (3.0)	Count	3 (5.5)	1 (5.9)	**$50,000 and greater (High)** N=67 (18.2)	Count	3 (5.5)	1 (5.9)
	Percent				Percent		
Totals N=368 (100%)		55 (100%)	17 (100%)	Totals N=368 (100%)		55 (100%)	17 (100%)

substantially since 1996.[39] As a result, these five power plants are the largest industrial sources of greenhouse gasses in the state.[40]

As provided below in Table 10 on the "Unequal Exposure to the Top Five Power Plant Polluters in Massachusetts," four of the five plants are located in low- to moderately-low income communities; indicating a rather strong class-bias in the siting of the worst polluting power plants in the state. In terms of racial bias, only the Mount Tom power plant is located in both a low-income and high-minority status community (Holyoke); otherwise the remaining four power plants are located in lower-minority status communities. Clearly, lower-income working class communities are disproportionately burdened by the some of the worst polluting power plants in all of New England.

Table 10: Unequal Exposure to the Top Five Power Plant (Fossil Fuel) Polluters in Massachusetts

Power Plant	Town	Income Status of Town	Racial Status of Town	SO2 Rate in 1st Half of 1999 (lbs./mmBTU)
Salem Harbor	Salem	medium-low income	moderately-low minority pop.	1.20
Mount Tom	Holyoke	low income	high minority pop.	1.20
Brayton Point	Somerset	medium-low income	low minority pop.	1.10
Mystic	Charlestown	medium-low income	moderately-low minority pop.	1.03
Canal	Sandwich	medium-high income	low minority pop.	0.87

[39] Data for the first half of 1999 shows significant increases in nitrogen oxide and carbon dioxide, and slight decreases for sulfur dioxide (with the exception of the Brayton Point and Canal plants, which showed considerable gains). However, it should be noted that the overall reductions in sulfur dioxide recorded during that time frame stemmed from the fact that many units were shut down for repairs or maintenance -- and not from improvement in air pollution control technologies. "Reports show that the Salem Harbor Plant in Salem was in fact shut down for good amount of time due to a fire at the plant, thus resulting in lower emission outputs. Even taking this into account, the emission rate of sulfur dioxide at Salem was still four times the emission rate of new coal-fire plants. The average emission rate of sulfur dioxide for all of Massachusetts was 1.04 lbs/mmBTU, 3.46 times the 0.3 lbs/mmBTU rate for newer, cleaner coal plants. See Michelle Toering, with Rob Sargent and Cindy Luppi, *Pollution Rising: New England Power Plants Emissions Trends 1st Half 1998 vs. 1st Half 1999* (Boston: A Report for the Campaign to Clean Up Polluting Power Plants, 1999), pp.2-4.

[40] Although they do not typically produce dangerous air pollution, the state's nuclear power plants continue to pose a threat of accidental radiation releases and are responsible for 99 percent of our high level radioactive waste.

According to a 2000 report by the Harvard School of Public Health, current emissions from the 805 megawatt Salem Harbor (Salem) and 1611 megawatt Brayton Point (Somerset) coal-fired power plants alone can be linked to 43,300 asthma attacks and nearly 300,000 daily incidents of upper respiratory symptoms per year among the 32 million people residing in New England, eastern New York, and New Jersey. An additional 159 premature deaths can be attributed to this pollution each year. However, for those living in communities adjacent to these plants, the health risks are greatest. Twenty percent of the total health impact occurs on 8 percent of the population that lives within 30 miles of the facilities.[41] The worst four polluters of these power plants are all located in lower-income communities, where the average household medium income is $39,999 or less. Thus, it would appear that working class communities once again are unequally exposed to industrial hazards in the Commonwealth.

Unequal Exposure to Incinerators

Municipal Solid Waste Combustors (MSWCs) are facilities that combust (burn) solid waste, in large part derived from household wastes. There are nine MSWCs currently in operation in Massachusetts, which combust approximately 3.3 million tons of trash each year. Incinerators are implicated in causing massive water and air pollution and related public health problems. For instance, according to MASSPIRG, garbage incinerators emit more mercury than any other source in the state.[42] Mercury, which is especially toxic to children and pregnant women, has been linked to kidney and nervous system damage, and developmental defects. The Environmental Protection Agency (EPA) has identified these facilities as being a major source of mercury emissions to the environment. The state Department of Environmental Protection (DEP) estimates that these facilities emit approximately 6,040 pounds of mercury into the air each year. DEP testing of in-stack concentrations or emissions of mercury for these facilities in 1994 averaged twice the new EPA limits.[43] In addition to air emissions, mercury may also exit these facilities in ash, especially fly ash. It is estimated that as much as another 6,000 pounds of mercury is captured by the air pollution control devices installed at these facilities.

As indicated in Table 10 on "Unequal Exposure to Municipal Solid Waste Combustors" (see following page), six of these nine incinerators are located in low and medium-low income communities, where the average medium household income is $39,999 or less. Only one of the nine incinerators is located in a high-income community, where the average median household

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[41] See Jonathan Levy, John D. Spengler, Dennis Hlinka, and David Sullivan, *Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants*, A report commissioned by the Clean Air Task Force (Harvard School of Public Health and Sullivant Environmental Consulting, May, 2000).

[42] See "MASSPIRG urges Cut in Solid Waste," in *MASSPIRG*, Vol.17, No. 4 (Winter 2000): 1-3.

[43] The DEP estimate is based on 1991-94 Stack Test Data, and available on-line at www.state.ma.us/dep/files/mercury/hgch3b.htm.

income is $50,000 or greater. Thus, lower-income communities ($39,999 or less) have twice the number of incinerators as higher-income communities ($40,000 or more). But while class considerations seem to be of some importance in the siting of these facilities, only one of the nine incinerators is located in a higher-minority status community (where 15% or more of the population are people of color). In fact, this is one of the few hazardous facilities in the Commonwealth where there does not appear to be a racial bias.

Table 11: Unequal Exposure to Municipal Solid Waste Combustors (MSWCs)

Town	Income Status of Town	Racial Status of Town	Mercury In-Stack EPA Limit80 (ug) (dscm)	Average Annual Amount of Mercury Emitted (Tons/Year)
N. Andover	high-income	low-minority population	297.0	1.11
Lawrence	low-income	high-minority population	276.0	0.41
Millbury	medium-low income	low-minority population	183.0	0.52
Haverhill	medium-low income	mod.-low minority population	163.0	0.35
Agawam	medium-low income	low minority population	153.1	0.08
Pittsfield	low income	low minority population	61.4	0.01
Rochester	medium-high income	low-minority population	61.0	0.11
Fall River	low-income	low minority population	25.6	N/A
Saugus	medium-high income	low minority population	17.0	0.4
9 Towns	6 of 9 towns are lower-income	1 of 9 towns are higher minority	160.0	3.02 (6,040 lbs.)

Note: There are also some 117 medical waste incinerators listed in the DEPs Division of Air Quality Control Stationary Source Enforcement Inventory System (SSEIS).[44]

[44] Since 1960, approximately 216 incinerators have been approved to burn medical and related wastes and other biological materials in Massachusetts (these include hospitals, health care centers, certain laboratories, and some veterinary clinics and crematoria). Nearly 100 of these incinerators are no longer operating. Of the 117

Unequal Community Exposure to Cumulative Environmental Hazards

Many past studies on the disproportionate exposure of low-income communities and communities of color have focused on a single hazardous facility or waste site. This study provides a method for measuring community exposure rates for all hazardous facilities and sites combined. In so doing, we have developed a point system which weighs the average risks of each various type of hazardous facility/site to arrive at a cumulative measure of community exposure to all potential hazards. The point system is as follows:

Type of Hazardous Facility or Site	Points for Rating Severity of Each Facility or Site
DEP Hazardous Waste Site (general)	1
DEP Hazardous Waste Site (Tier I-II)	5
EPA-NPL (Superfund) Waste Site	25
Large Power Plant – top five polluter	25
Small Power Plant	10
Proposed Power Plant	5
TURA Industrial Facility	5
Municipal Incinerator	20
Resource Recovery Facility	10
Incinerator Ash Landfill	5
Demolition Landfill	3
Illegal Site	5
Sludge Landfill	5
Tire Pile	5
Municipal Solid Waste Landfill	5
Trash Transfer Station	5

incinerators currently in operation, 53 are located in hospitals and other health care related facilities; 22 are located in university, laboratory; and commercial facilities; and 24 are located in veterinary and related facilities. But because most medical waste incinerators are small units located at hospitals and other health care facilities, EPA regulations do not require emissions testing for mercury. However, some limited DEP testing has indicated that medical incinerators emit an average of 780.3 pounds of mercury into the air each year. For additional mercury data, see Massachusetts Department of Environmental Protection, *Mercury in Massachusetts: An Evaluation of Sources, Emissions, Impacts and Controls* (Boston: June, 1996), available at www.state.ma.us/dep/files/mercury/hgtoc.htm.

Likewise, low-income communities (where the median household income is $29,999 or less) average an exposure rate of 27.9 points per square mile. This rate stands in dramatic contrast to the exposure rates for all other higher-income communities (where the average median household income is $30,000 or greater), which ranges from 6.9 to 8.9 points per square mile. As a result, *low-income communities face a cumulative exposure rate to environmentally hazardous facilities and sites which is 3.13 to 4.04 times greater than all other communities (measured by income) in the state.* As is the case with communities of color, low-income communities are disproportionately exposed to environmental hazards of all kinds. Ecological racism and class-based environmental injustices appear to be profound in the Commonwealth of Massachusetts.

This claim is confirmed on Table 13 on the "15 Most Environmentally Overburdened Towns in Massachusetts" (see following page), which attempts to list the communities most disproportionately impacted by the siting of environmentally hazardous industrial facilities and sites. We have constructed an exposure rate utilizing the method described above (whereby the point totals for all hazards present in the community are added together and then divided by the total area). *As seen in the table, 14 of the 15 most environmentally overburdened towns in Massachusetts are of lower-income status (average household median income of $39,999 or less). In fact, 9 of the 15 towns can be classified as low-income communities (where the average household median income is $29,999 or less). Likewise, 9 of the 15 most environmentally overburdened towns in the state are of higher-minority status (where 15% or more of the population are people of color). Some 6 of the 15 towns are of high-minority status (where 25% or more of the population are people of color).*

The conclusion to be drawn from this preliminary analysis is that the communities most heavily burdened with environmentally hazardous industrial facilities and sites are overwhelmingly low-income and/or communities of color. Clearly, not all Massachusetts residents are polluted equally – working class whites and people of color are being disproportionately impacted. Governmental action is urgently required to address ecological racism and environmental injustices in all forms in each of these communities. We recommend that adoption of an Environmental Justice Designation Bill which would direct state environmental officials to designate overburdened communities as Areas of Critical Environmental Justice Concern (ACEJC).

Table 13: Top 15 Most Environmentally Overburdened Towns in Massachusetts (Total Points per Square Mile)

Rank	Town Name	Points per Square Mile	Class Status of Town	Racial Status of Town
1	Downtown Boston	224.8	Low-Income ($29,468)	High-Minority pop. (31.9%)
2	Charlestown	134.3	Medium-Low ($35,706)	Mod.-Low pop. (5.1%)
3	Chelsea	127.4	Low-Income ($24,144)	High-Minority pop. (30.3%)
4	South Boston	126.2	Low-Income ($25,539)	Low Minority pop. (4.2%)
5	East Boston	123.3	Low-Income ($22,925)	Mod.-High Minority pop. (23.6%)
6	Cambridge	115.0	Med.-Low Income ($33,140)	Mod.-High Minority pop. (24.9%)
7	Somerville	104.7	Med.-Low Income ($32,455)	Mod.-Low Minority pop. (11.3%)
8	Roxbury	101.3	Low-Income ($20,518)	High Minority pop. (94.0%)
9	Allston/Brighton	100.0	Low-Income ($25,262)	High Minority pop. (26.9%)
10	Watertown	98.6	Med.-High Income ($43,490)	Low-Minority pop. (3.8%)
11	Everett	98.1	Med.-Low Income ($30,786)	Mod.-Low Minority pop. (6.0%)
12	Boston (all neighborhoods)	84.0	Low-Income ($29,180)	High-Minority pop. (37%)
13	Dorchester	81.3	Low-Income ($29,468)	High Minority pop. (50.7%)
14	Lawrence	59.3	Low-Income ($22,183)	High-Minority pop. (34.9%)
15	Malden	57.8	Med.-Low Income ($34,244)	Mod.-Low Minority pop. (10.1%)
Totals	15 Towns		14 of the 15 most overburdened towns are lower-income -- ($39,999 or less)	9 of the 15 most overburdened towns have high to mod.-high minority populations -- (15% or more people of color)

WHAT CAN BE DONE?: RECOMMENDATIONS FOR ADDRESSING PROBLEMS OF ENVIRONMENTAL INJUSTICE IN THE COMMONWEALTH

Lower-income communities and communities of color in Massachusetts are clearly overburdened with environmentally hazardous industrial facilities, toxic waste sites, landfills, power plants, incinerators, and other operations. The unequal exposure of people of color and working families to these polluting facilities is a function of both governmental policy and business practices which promote economic growth over public health. However, in this preliminary report, we do not undertake a careful historical analysis of the political-economic and social forces which created these disparities. Therefore, we do not answer the problem of the "chicken or the egg"; whether or not unequal exposure to environmental hazards is a result of the siting process where businesses and government agencies selectively target lower-income and minority communities for establishing environmentally hazardous industrial facilities/sites; or whether these hazardous facilities/sites were established rather "fairly" but resulted in the surrounding neighborhoods becoming poorer and home to a greater percentage of people of color and lower-income families. Clearly, such factors as poverty, housing discrimination, bank lending policies, local planning and zoning practices, and the locations of jobs, transportation centers and networks, and other public services all play important roles.

Without a doubt, when any citizen is unwillingly harmed by exposure to industrial toxic pollutants found in the environment, an injustice is being perpetrated. So that no citizen of any community be impacted at all, government agencies on all levels must deepen efforts to reduce the overall level of dangerous pollutants currently found in the environment, as well as our schools, the home, and workplace. In this regard, the Toxic Use Reduction Act (TURA) is a model program which should be expanded. Likewise, the Department of Environmental Protection should take steps to reduce waste, increase recycling and continue a moratorium on new landfills and incinerators. Similarly, capping the emissions of the older power plants at levels similar to those plants built more recently would reduce emissions in Massachusetts by tens of thousands of tons. In the wake of deregulation, it would also ensure that newer, cleaner plants benefit from a level playing field by removing the pollution subsidy these old plants currently enjoy. Recent commitments by several of the plant owners to substantially reduce emissions even while increasing energy output are strong evidence that major cleanups of these plants can occur without major implications for jobs and energy reliability.

But as part of these efforts, the state must also begin to more systematically address the environmental injustices documented in this report. This includes the establishment of local, state and federal government programs and policies which insure environmental equity; avoid the siting of additional hazardous facilities/sites in already overburdened lower-income communities and communities of color; provide resources to these overburdened communities in order to create environmental amenities which can partly offset other environmental risks; and promote greater citizen participation in the problem-solving and decision-making processes which impact those communities. It is important that these strategies simultaneously address environmental injustices in both racial and economic class contexts. Otherwise, efforts to redress one type of inequity over the other could serve to foster continued inequity in the other group.

Massachusetts already has an Areas of Critical Environmental Concern (ACE) law, which protects natural resources from pollution. Given the disproportionate exposure of lower-income communities and communities of color to ecological hazards, however, further protections are needed. We recommend that adoption of an Environmental Justice Designation Bill which would direct state environmental officials to designate overburdened communities as Areas of Critical Environmental Justice Concern (ACEJC). Such an Act could amend the duties and responsibilities of the Executive Office of Environmental Affairs (Chapter 21A, Section 2) and call for the development of statewide policies regarding the protection and use of areas of critical environmental justice concern to the Commonwealth. As part of this bill, the capacity of the Department of Environmental Protection and the Executive Office of Environmental Affairs to fulfill it's mission would also need to be enhanced with the provision of additional funding, staff, and other resources. The passage of such an act would be a critically important first step for policy-makers, government agencies, community activists, and ordinary citizens to begin working together to overcome the profound environmental injustices which exist in the Commonwealth of Massachusetts.

Wayland

My name is Ronald H. Wayland . My residence is 61 Edgehill Road, Winthrop, MA 02152

I am opposed to the building of the proposed Runway 14/32 at Logan International Airport, America's most urban airport.

I am opposed to the building of the proposed center strip taxiway at America's most urban airport..

I believe that this state's continued reliance upon and almost total commitment to perhaps this nation's smallest and most urban airport for its almost total commercial air transportation needs is clearly environmentally unjust and increasingly unconscionable.

I believe that MassPort's belated yet highly publicized "Regional Transportation Plan", even if well intentioned, is in fact and for the most part nothing more than a public relations ploy.

I believe that the recent growth at airports in Rhode Island and New Hampshire have nothing to do with anything initiated by MassPort .

I believe that, if successful in increasing capacity at Americas's most urban airport and once the Big Dig is completed, MassPort will launch a massive effort to reverse the gains achieved at Green and Manchester airports. Recent television ads by MassPort suggesting that air travelers will be flying through Logan airport, is a precursor to that effort.

I believe that the token success achieved at Worcester Airport has in fact increased air traffic at Americas's most urban airport. I would invite the media, the FAA and the judge who will ultimately hear this case to consider the deals MassPort has made with American Eagle and others to get them to fly out of Worcester. If increased air traffic out of Worcester means even more air traffic out of America's most urban airport. How does that reduce delays?

I believe that MassPort's real objective is increased capacity at Boston and America's most urban airport. This is captured in a video they produced in 1989, entitled Moving us into the 21st century. The total plan then was to

increase capacity. MassPort's "Regional Transportation plan then was to add more bus stops around the Boston area. That remains the most effective and believable element of their current regional plans.

I believe that any highly touted benefits derived from the exclusion of stage two aircraft at Logan were almost immediately wiped out by the frequency of additional arrivals and departures. I don't think anybody disagrees with that.

I believe that the recently announced benefits of the proposed stage four aircraft will be hardly noticeable to those who live near our airports. I think even the world's biggest airport association agrees with that conclusion.

I believe that the reduced noise levels of stage three and stage four aircraft were achieved at the expense of increased emission. I don't believe there is any argument on this either.

I believe that these increased emissions pose an even more serious health hazard than does the impact of airplane noise especially at America's most urban airport. MassPort and the FAA response on this has been. "We don't know."

I believe we owe it to our citizens to find out the specifics of this hazard before we increase capacity at America's most urban airport. MassPort and the FAA may say that this is difficult to analyze. I would suggest that Massachusetts might have the world's best laboratory for studying the impact of urban airports. It is called Winthrop Massachusetts. Noise and air pollution in Winthrop is almost exclusively from Logan airport. An initial health survey suggests that the airport does impact the health of those who live closest to the airport. I believe we should fund a comprehensive study and get the facts before we commit to expansion at America's most urban airport.

I believe there are other and in fact better way of reducing delays at Americas's most urban airport and first among these is for the FAA not to allow MassPort to increase capacity at Logan.

61 Edgehill Road, Winthrop, MA 02152, Phone: 617-846-0801, e-mail: nebaway@aol.com

Wayland

I believe that MassPort should immediately implement the economic remedies that would have an immediate impact on delays at America's most urban airport. I refer to peak hour pricing.

I believe immediate consideration should be given to technological advances that would directly impact delays at America's most urban airport.

I think we should encourage, not by word but by deed, the increased use of high-speed rail especially from Boston to its most frequent destination, New York City. By deed I mean not allowing MassPort to expand it capacity.

I believe we should use existing rail beds to connect our regional airports and thus share the burden of our air transportation system.

There is much more that I could say but in the interest of time I would finally say that I believe the business community, MassPort, the State of Massachusetts, the FAA, the City of Boston and our concerned citizens should put aside our fight over this bone known as runway 14/32. Rather we should join together and apply a new Vision to our region's transportation needs for the 21st century. When you look across this country and around the world you find countries and communities, not trying to get a few more years out of the old jalopy, but rather moving forward with solutions that will preserve their culture and insure prosperity for their community. Many years ago, because of our deep ocean harbor, which was the world's transportation system, Boston was known as the Hub of the universe. A change of Vision and the building of the Erie Canal move that Hub to New York City. Today the sky and not the water is our preeminent transportation system. In that arena Boston's urban airport is as a little stream. This nation and this region need to build deep harbors for the sky. This should be our national goal and all of us together should be working to make that happen.

Thank you.

61 Edgehill Road, Winthrop, MA 02152, Phone: 617-846-0801, e-mail: nebaway@aol.com

Cohasset Form Letter (327)

Mr. & Mrs. Joseph C. Ligotti
John & Donna McManus
Ansley Pearce
Stacey V. Weaver

4/9/01

Letter 327

Mr. John Silva
FAA, Department of Transportation
New England Region
12 New England Executive Park
Box 510
Burlington MA 01803

Re: Logan Airport expansion

Dear Mr. Silva,

As a resident of the South Shore I would like to express my concerns with the proposed addition of Runway 14/32 and the current air traffic pattern of Runway 22 and Please urge Massport and to seriously consider the alternate routings proposed by the South Shore Jet Pollution Council.

Runway 22 currently overflies the South Shore nearly constantly with 30,000 jet aircraft. With the addition of Runway 14/32 Massport plans to increase traffic over the South Shore to 98,400! Surely that increase will cause a signifigant and negative impact on everyone who lives on the South Shore. Massport may report that these planes are flying over water, but every day and night they are flying over homes on the South Shore.

Please press Massport to give great attention to reducing environmental impacts if these runways must be built. Ask them to work with the South Shore Jet Pollution Council to find solutions that work for everyone.

Also, could you please explain to me why the United States Environmental Protection Agency, the National Reasearch Council, the Federal Regulatory Council, the American National Standards Institute and the World Health Organization all apply the more sensitive and realistic DNL 55dB standard for identifying areas that are signifigantly impacted by aircraft noise while Massport and the FAA use a 65dB measurement? It seems wrong to apply lesser standards for residents near airports.

Thank you for your attention.

Sincerely,

Mr+Mrs Joseph G. Ligotti

APR 12 2001

Everett Form Letter (328)

Clara Cognata
Jean Cesauni
Mary C. Downing
Patricia Gaglione-Beverly Brestling
Grace E. Galloway
Barbara Haley
Phyllis Harper
Darren & Cynthia Hartall
Margaret M. Hartnett
Lillian Holmiston
Robert W. Johnston, Sr.
Lisa Marie Kulof
Joseph H. Lyons
John & Augustine Maddaleni
Louise Nigro
Teresa R. O'Donnell
Grace M. Pednerson
Dorothy Peters
Charles Remington
Geraldine A. Rossi
Eunice & J. Roger Sanderson
Lucille E. Sheehan

John C. Silva, Manager Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Re: Supplemental Draft EIS/Final EIR
Logan Airside Improvement Planning Project

Dear Mr. Silva:

I am writing to comment on the Supplemental Draft EIS/Final EIR with respect to the Logan Airside Improvement Planning Project.

According to Massport the distribution of jet aircraft operations forecast, from an annual 1999 low to an annual 2010 low, there will be a seven (7%) percent increase, indicating a constant upward north-south directional use in spite of Runway 14/32 being operational. In addition, Runway 14/32 would increase annual numbers of flight to seventy-five thousand (75,000) as long as its remains unidirectional, a number certainly to have an adverse impact on the City of Everett.

Although the Runway is proposed as unidirectional, there appears to be no directive as to its permanence so that it may be amended or modified to become bidirectional at Massport's selection thereby increasing the number of flights in excess of the seventy-five thousand (75,000) expected.

The forecast of percentages of directional flights of jet aircraft operations and the fact that Runway 14/32 whether unidirectional or bidirectional, will have an increased impact on the City of Everett. There will be an increase of noise endurance, an increase in vehicular airport related traffic and a decrease of air quality. This should necessitate an expansion of Massport assistance to communities, such as Everett, affected by the proposed Runway.

Although the economic strength of the Commonwealth is in large part dependant upon sound airport planning and management there must be a well-balanced plan to protect the communities surrounding Logan Airport from any environmentally intrusive impact.

I wish to go on record as being in strong opposition to the proposed construction of the new runway at Logan Airport.

Thank you for the opportunity to comment on the project.

Sincerely,

40 Bow Street #2
Everett, MA 02149-2904

MAY 04 2001

Jamaica Plain Form Letter (329)

Priscilla Biondi
Helen Eiver
Janell Fiarma
Phyllis Fisher
Gloria P.
Dave Parlau
Laura Pattison
Marsha Raredon, Paul Gore Beecher Community Garden, etc.
Ken Tanguih
Colin S. Thormas
Rebecca Trarreu
Leesak Stolfach
Laura Sylvam
Daniel Wenten

Letter 329

Paul Gore/Beecher St. Garden
Jamaica Plain, MA 02130
April 1, 2001

John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Dear Mr. Silva,

We are writing to express our dismay in Massport's Environmental Impact Statement regarding Runway 14/32, the centerfield taxiway, and Massport's proposals to change procedures for landing during bad weather. As community gardeners committed to maintaining green space in Boston, issues of air and noise pollution are of major concern to us.

We feel that Massport's document does not adequately address the impact of its proposals on the health of East Boston residents. A long promised study on air pollution and health risks in neighborhoods surrounding the airport has yet to be undertaken. Massport promised this study years ago. Nor does the EIS address the impact of noise on neighborhoods beyond a certain radius from the airport, though residents in our neighborhood alone have logged over 1000 complaints in the past year.

We understand that delays at Logan Airport have significant consequences for individuals as well as the region's economy. We wish that Massport's process had included a trial period for interventions such as the Peak Period Pricing strategy or the slot system used at other major urban airports. We believe that other alternatives must be explored rather than accommodating ever increasing numbers of travelers at Logan.

Sincerely,
Marsha Raseden Paul Gore Beecher Community Garden
Priscilla Biondi, Paul Gore Beecher Community Garden
Ken Tanguth, Paul/Gore Beecher Community Garden
Helen Ewer, Paul Gore Beecher St. Garden
Darrell Jarvis 6 Beaufort Rd #3 J.P.
Paul Gore Beecher
Theresa L Farmer

Cc: Senators Kennedy, Kerry, and Secretary Durand

Phyllis Fisher, Paul Gore Beecher St Garden

APR 04 2001

Teresa K Stolbach Paul gore Beecher St. Garden
Glynys Thomas 20 Montclair Ave Roslindale

Miscellaneous Form Letter (330)

Alan Berns
Gordon Bloom
Monica Bloom
Eve Brauner
Steve L. Brauner
Michael & Hillary Lanziera
Myra Love
Martha Merson

April 7, 2001

John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Dear Mr. Silva,

We are writing to express our concerns regarding Massport's plan to build Runway 14/32, the centerfield taxiway, and Massport's proposals to change procedures for landing during bad weather. As users of Logan Airport, timely arrivals and departures are important to us. However, the "preferred alternative" outlined in EOEA #10458 is a misguided attempt to address delays.

The remedies of one 5,000 foot runway and a new taxiway will be obsolete by the time they are built. If airport passenger numbers increase from 27.5 million to 37 million, we need more than a 5,000 foot runway. Unfortunately, Logan is at capacity. It serves its 20 plus million passengers with difficulty. Its roads and runways cannot service more than this. We need regional solutions which divert air and vehicle traffic from Logan to outlying airports since the majority of Logan users call the suburbs home. The residents who live close to the airport shoulder an unfair burden of air and noise pollution as it currently stands. Many neighborhoods close to the airport also have high asthma rates. The Massport document does nothing to assess the current levels of toxicity people tolerate from the Tobin Bridge, Expressway, diesel buses, and port operations. Adding another burden to these residents is an inequitable solution.

We understand that delays at Logan Airport have significant consequences for individuals as well as the region's economy. Yet we wish that Massport's process had included a trial period for interventions (for example, the slot system which is used to cap per hour operations other major urban airports). We believe that other alternatives must be explored rather than accommodating ever increasing numbers of travelers at Logan.

Sincerely,

Martha W Mercer JP Belmont MA
Norma Bloom Belmont, MA
Brookline
Myra N. Love JP
Eve Brauner Waltham

Cc: Senators Kennedy, Kerry, and Secretary ~~Durand~~ Pugsley

APR 18 2001

Jamaica Plain Form Letter (331)

Lorna Gibson
Jean Hess
Donald Schatz
Eunice Schatz
Myriam Steinback

16 Eastland Road
Jamaica Plain MA 02130
April 23, 2001

John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Dear Mr. Silva,

I am writing to express my opposition to Massport's plan to build Runway 14/32, the centerfield taxiway, and Massport's proposals to change procedures for landing during bad weather. The "preferred alternative" outlined in EOEA #10458 is a misguided attempt to address delays.

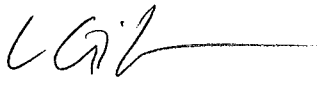
Boston is a world class city. It deserves a world class airport. But the economy of Massachusetts is booming beyond Boston's borders. The latest Census figures show that more peole are moving to towns around the 495 belt, such as Franklin and Medway. The figures also show increasing communities of color in areas like Chelsea. Therefore, increasing capacity at Logan to accommodate ever more passengers is a misguided solution. It locates the noise and air pollution burdens near poor communities whose residents are already at higher risk for asthma and other diseases. It locates the means of transportation far from the target users. Therefore, they clog the roads and tunnels to get to Logan, adding more air pollution to the environment. Unfortunately, Logan is at capacity. It serves its 20 plus million passengers with difficulty. Its roads and runways cannot service more than this. We need regional solutions which divert air and vehicle traffic from Logan to outlying airports. The Massport document does nothing to assess the current levels of toxicity people tolerate from the Tobin Bridge, Expressway, diesel buses, and port operations. Adding another burden to these residents is an inequitable solution.

I understand that delays at Logan Airport have significant consequences for individuals as well as the region's economy. Yet I wish that Massport's process had included a trial period for interventions (for example, the slot system which is used to

APR 2 6 2001

cap per hour operations other major urban airports). I believe that other alternatives must be explored rather than accommodating ever increasing numbers of travelers at Logan.

Sincerely,



Lorna Gibson
Cc: Arthur Pugsley, MEPA, EOEA 10458, 251 Causeway St., Boston, MA 02114

Roslindale Form Letter (332)

Richard Allsbrook
Pia K. Bertelli
Ruth E. Blackburn
Phyllis Bluhm
Ana G. Boyd
Nancy J. Campbell
Christine M. Cavanaugh
Carol A. Celata
Margo Custer
Walter Dardano
Marcia Dean
Victor DeGruttals
Diane & Richard Duggan
Marrey Embers
Angela & Daniel Farnkoff, Jr
Edward J. Freeley, III
EJ Freeley
Les Freeley
Robert W. Freeley
Margaret Feldman Firinne
Ruth Harzbecker
Matthew C. Holmes
Anne Kinnane
Henry Leitao
Kathyrn L. Lino
John Mahony
Joan H. Matulis
Joanne M. McGrath
Abbie Meyer
Catherine & William Miller
Mark Minton
Mary Moynihan
Amy Oalican
Erin Marie Osner
John O'Sullivan
Rebecca Ponzio
Maribel Quinones
Stephen M. Smith
Claire A. St. Hilaire
Brenda Stone
Mary E. Sullivan
Marcia Therndull
Mary Jane Van Tassell
David Wean
Karen L. Weber
Alan Wright
Cynthia Zalin
Cynthia Zawadski

Letter 332

April 18, 2001

John C. Silva
Manager, Environmental Programs
Airports Division, ANE-600
New England Region
12 New England Executive Park
Burlington, MA 01803

Dear Mr. Silva:

We are writing to you to voice our opposition to the proposed new runway that the Massachusetts Port Authority seeks to build at Logan Airport. Runway 14/32 will be environmentally destructive to our neighborhood as it will result in a tripling of aircraft traffic over our homes bringing more noise and air pollution.

Please do not approve Massport's requests for a sixth runway and centerfield taxiway. Instead require them to implement other solutions to the less than 5% of flights that are delayed at Logan Airport such as peak-hour pricing, expansion of regional airports and promotion of alternative means of transportation.

In addition, we urgently request that you require Massport to install a noise monitor in a location near our neighborhood. Massport has been severely negligent in monitoring the impact of noise brought on by the use of Runway 27.

Personal Notes: Please require Massport to work with congestion pricing seriously. The economic modeling used in the first EIS/EIR was completely inadequate.

Signed: Amy Wright

Name: 57 Arborough Road

Address: Roslindale, MA 02131

APR 26 2001

Miscellaneous Form E-Mail (333)

Chris Attridge
Michelle Arkins
Roy Auty
Tim Brown
Paul Capobianco
Michael Costello
Jeff Donovan
Ellie Doyle
Alan Ellman
Matt Ferrara
William E. Fowler, Jr.
Bernhard Heine
Ralf Klein
Richard Levasseur
Lisa Lojko
Vikas Malik
Frederic Mason
Rob Maynard
Thomas J. McBride
Deborah A. Mercurio
Kent Meyers
Michael Moscaritolo
Peter A. Overland
Trish Powell
Robert E. Puopolo
Alden Reed
Ricardo Salazar
Irma Sullivan
William F. Waters
Patricia Whiting
Lawrence Willwerth
Anne Yount

Letter 333

RECEIVED

JUN 5 2001

MEPA

Kehoe, Barbara (ENV)

From: Chris Attridge [cattridge@esri.com]
Sent: Tuesday, June 05, 2001 12:01 PM
To: Kehoe, Barbara (ENV)
Subject: environmental document number EOEA#10458

I am writing to express my support for Logan Airport Runway 14/32. I am a frequent traveler, traveling at least once a week, and I am continuously delayed or cancelled flying in and out of Logan Airport. The delays are conveyed to travelers as, "only one run way is open and there is a back up", "the wind shifted and we can not have take off's or landings at the moment", "Your plane is delayed because your plane can't get out of Boston to get here", and the excuses go on.

In reading and educating myself about the possible benefits and downfalls of the new run way I have found that:

· Runway 14/32 will reduce overall delays by one-third, finally knocking Logan off the list of top ten most delayed airports and will cut delays during northwest winds by 90%. Businesses will add Boston back to their list of potential locations for growth instead of locating closer to regional airports like Manchester, NH. Private companies waste millions of dollars a year in employee salaries paying for their employees to WAIT for planes at Logan - if an airport can provide the flights they need without delays - Where would you move your company to?

· Runway 14/32 will reduce noise for Logan's closest neighbors by more suitably distributing flights. It will also cut nighttime flights by up to % because of reduced delays. The neighbors in these areas have moved to the area knowing that an airport was there and that they would have some inconvenienced noise. It is important to understand the issues correctly and realize that the would actually have a noise reduction, especially in the evenings. I have been scheduled on many flights that were scheduled to land at 6pm and instead land between the hours of 9pm - 11pm, due to "congestion" on the runways.

· Runway 14/32 will direct more than 75,000 flights a year over Boston Harbor instead of area neighborhoods, making over water flights the primary operation at Logan. Neighboring areas don't have a decision if Continental would like to add 10 new flights a day to their schedule on the existing runways, but do if we just redirect those flights over the water on a new runway?

· Runway 14/32 and the other airside projects will improve local air quality as aircraft spend less time idling on taxiways and circling overhead. With a new runway, 500-700 tons per year of pollution will be eliminated.

· Due to regionalization, takeoffs and landing have decreased by almost 30,000 (6%) at Logan over the past two years. In spite of fewer flight, delays have increased, clearly demonstrating that Logan's delays are caused by an airfield deficiency and not airline scheduling.

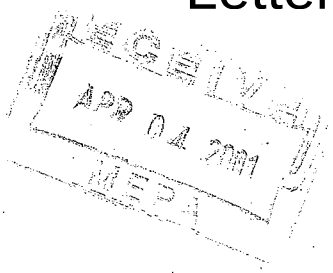
Thank you for your time spent reading my concerns. Please support runway 14/32.

ank you-
ris Attridge
Account Manager - NYS
for a computer software company

Miscellaneous Form Letter (334)

David Bowman
Brittany Howe
Ana Vega

Letter 334 AP



10458

Sender name -> Brittany Howe
Address -> 27 Meade Rd
City -> Billerica
State -> MA
Zip -> 01821

Sent: April 3, 2001

To: senator@kennedy.senate.gov;john_kerry@kerry.senate.gov;remote-printer.Barney_Frank/US_Congress@2.8.1.0.5.2.2.2.0.2.1.tpc.int;Goffice@state.ma.us;Thomas.Obrien@state.ma.us;Mpacheco@senate.state.ma.us;mcolclough@state.ma.us;fwd_to_Durand@sierraclubmass.org;fwd_to_Buckingham@sierraclubmass.org;fwd_to_Sullivan@sierraclubmass.org.

Cc: webmaster@sierraclub.org;petitions@sierraclubmass.org

Moratorium on Airport Expansion.

To my elected Representatives:

Airport expansion threatens our natural environment and surrounding communities. The resulting high noise levels, pollution and traffic congestion cause numerous social and health problems, including loss of open space and wetlands areas, and despoiled natural; recreation areas. Expanded air traffic also erodes property values, which in turn, adversely impact the maintenance of schools and other community services.

In order to maximize the utility of our existing air, highway, and rail transportation systems in such a way that we have captured every possible efficiency in each system and made every effort to minimize additional environmental degradation, I urge you to support the following measures:

A moratorium on all airport expansion until:

1) The North/South Rail Link project (NSRL) through Boston is constructed as an alternative to continued airport and highway expansion. The construction of the NSRL will extend the benefits of Amtrak's successful high-speed Northeast Corridor (NEC) to northern Massachusetts, Main, new Hampshire and Vermont.

2) The U.S. Department of Transportation (USDOT/ONE DOT) completes a study of all airport, highway and rail systems contained within the FAA's 'Eastern Region' and 'New England Region; with the objective of reducing demand for short distance air trips under 400 miles. This study will assume the North/South Rail link construction is complete.

3) A properly funded Citizen's Advisory Committee, representing environmental and community groups throughout the regions, must be involved in the scooping and the evaluation of this study.

Until all of these objectives have been reached, I ask you to oppose any further airport expansion in our region.

Kehoe, Barbara (ENV)

From: George A. Antoniadis [gantoniadis@alphaflying.com]
Sent: Thursday, June 07, 2001 8:00 PM
To: Kehoe, Barbara (ENV)
Subject: Environmental Document EOEA #10458

Ref: Environmental Document EOEA #10458

As a very frequent user of Logan Airport, I fully support the construction of Runway 14/32.

We all know that Logan is one of the ten most delayed airports in the US. These delays effect our economy, while also causing more air pollution and noise pollution(more idling aircraft waiting, and more circling overhead.)

The new runway will bring traffic over the harbour, thus reducing noise pollution in the areas that suffer currently.

Help keep Logan abreast of the times and a good environmental citizen!

George A. Antoniadis

RECEIVED
JUN 7 2001
MEPA

Letter 336

Kehoe, Barbara (ENV)

rom: Paul Bacinschi [paulbacinschi@hotmail.com]
Sent: Friday, June 08, 2001 1:21 PM
To: Kehoe, Barbara (ENV)
Subject: Environmental Document Number EOEA#10458

RECEIVED
JUN 8 2001
MEPA

Dear Madam/Sir,

As a frequent traveler through Logan airport I am sending this message in support to the construction of Runway 14/32.

I have been traveling weekly for business purposes in Boston area for a year now; the enhancement of Logan airport is very important to avoid delays and weather dependency. Also I understand it will reduce noise for Logan's closest neighbors by directing more flights over Boston Harbor, it will improve local air quality as aircraft spend less time idling on taxiways and circling overhead and will address the proven situation that delays are caused by an airfield deficiency and not airline scheduling at Logan International Airport.

Sincerely yours

Paul Bacinschi.

"Computers are useless. They can only give you answers."
Pablo Picasso

****
* Paul Bacinschi - Senior Lead Architect
* home (416) 482-1770 cell (416) 565-1012/1902
****

Get Your Private, Free E-mail from MSN Hotmail at http://www.hotmail.com.

Letter 337

Kehoe, Barbara (ENV)

From: sbarylick@vantagetravel.com
Sent: Wednesday, June 06, 2001 2:43 PM
To: Kehoe, Barbara (ENV)
Subject: BUILD THE RUNWAY !!!!!!

RECEIVED
JUN 6 2001
MEPA

As a frequent traveler out of Logan and back, I can assure you that Logan lacks amenities that competitors around the world have already.

Gate capacity-need more and new facilities

Ticketing facilities-ditto

Baggage handling-ditto

Runway capacity-need TWO runways
Build one into the harbor parallel to 15/33 offset into the water-and 14/32 at 8,000 feet.

Cargo capacity-ditto

Hangars-Ditto

Shopping-Ditto

Parking-Ditto

Restaurants-Ditto

(You get the picture. My dad worked for Northeast and Delta in Boston over a 33 year period-I have seen Logan in all it's incarnations-and it does not come close to other major international airports-it stinks.)

All these areas need major attention immediately if Boston, Eastern Massachusetts, and all of New England is to remain competitive in the United States, North America and world marketplace.

Boston/Logan needs Runway 14/32 NOW.

Boston needs a 14/32 to be extended to 8,000 feet in length to remain competitive with it's east coast rivals-JFK, EWR, PHL, IAD, and even LGA.

Let's face it, politicians have stirred up opposition amongst citizenry for years on the airport issues.

And it's all based on planes being noisy, dirty, etc.

Airplanes are much quieter, less noisy, and pollute less, while having become mass transit for all of us to vacation, do business, visit family and friends.

Boston will become a second-rate backwater if we do not demand that our airport is the top priority it should be. For commerce, economics, education, medicine, finances, politics, and more.

My rant. My e-mail, but please build the runway, go forward for the benefit of all citizens of New England.

Letter 338

'ehoe, Barbara (ENV)

From: Peter Bell [pete5668@mediaone.net]
Sent: Tuesday, June 05, 2001 7:07 PM
To: Kehoe, Barbara (ENV)
Subject: Forget runway 14/32. It is time to build Moakley International Airport NOW.

Runway 14/32 is a bandaid we don't need. What we need is an airfield that can handle more traffic. We need to catch up with NYC and Chicago. We need to forget about the convention center and build a second airport. Fill in some of the harbor with Big Dig dirt, and fix our air traffic nightmares for the next century.

RECEIVED
JUN 5 2001
MEPA

Kehoe, Barbara (ENV)

Letter 339

From: palma@starpower.net
Sent: Tuesday, June 05, 2001 5:12 PM
To: Kehoe, Barbara (ENV)
Subject: EOEA #10458 comments

Dear Ms. Kehoe, Contrary to the proposed advocacy message I received by anonymous email, I do not believe the airlines are innocent victims of runway congestion at Logan airport. My experience with USAIRWAYS express leads me to the conclusion that this airline deliberately overscheduled flights. I have been flying from the Washington DC area to Boston for over thirty years. I will never voluntarily fly into Logan again. Sincerely, Tom Connelly

RECEIVED
JUN 5 2001
MEPA

Letter 340

'Kehoe, Barbara (ENV)

From: Renae Costa [rcosta@optikos.com]
Sent: Tuesday, June 05, 2001 11:04 AM
To: 'barbara.kehoe@state.ma.us'
Subject: NEW RUNWAY!!!

please make delays at Logan go away!!! I hate flying out of Logan and the last time I had to fly anywhere I flew out of TF Greene because Logan is such a pain in the butt!!! please start construction for a new runway at Logan!!!!

Renae Costa
Optikos Corporation
Tel: 617-354-7557
Fax: 617-354-5946

RECEIVED
JUN 5 2001
MEPA

RECEIVED
CAPITAL PROGRAMS
DEPARTMENT

MAY 24 11 32 AM '01

Letter 341

May 21, 2001

Massachusetts Port Authority
One Harborside Drive
Suite 200S
East Boston, MA 02128-2909

Comment on the Supplemental Draft Environmental Impact Assessment

To Whom It May Concern:

Your failure to notify any regional planning commissions, towns and cities, and private citizens in New Hampshire or involve them in the discussion of developments linked to the supplemental draft environmental impact statement for Logan Airport violates basic principles of public participation and means that input from the community of interested parties living in southern New Hampshire communities is virtually absent from the record.

The supplemental draft environmental impact statement confuses volume for quality and pays lip service to significant concerns in a number of areas relating to the regional framework for air transportation.

Respectfully yours,

William Dalessandro
26 Mack Hill Road
Amherst, NH 03031

RECEIVED
MAY 24 2001
MASSACHUSETTS PORT AUTHORITY
AVIATION PLANNING & DEVELOPMENT

Letter 342

AP

RECEIVED

MAY 22 2001

MEPA

May 16, 2001
RE: EOEA #10458

MEPA
251 Causeway St.
Boston, MA

Dear Secretary Pugsley,

I am writing to express my dissatisfaction with Massport's plan to build Runway 14/32, the centerfield taxiway, and Massport's proposals to change procedures for landing during bad weather. As a health care practitioner and Boston resident, issues of air and noise pollution are of major concern to me.

While it may be that the Environmental Impact Statement submitted by Massport rationalizes the improvements it is proposing, it does not go far enough to warrant approval. Logan Airport is known as one of the top six polluters in Massachusetts. Eyewitnesses testify to the noxious fumes, to the effects of anti-freeze, to the pollutants that rot their cars and stick to every surface. If anyone would want to deny the negative effects of airplanes, it would be the neighbors who have lived side-by-side with Logan Airport. But these people are speaking out. Now is the perfect time to put the health of Massachusetts' residents ahead of corporations' right to idle machinery with toxic fumes next to a densely populated neighborhood.

Airports should not be allowed to continue to operate without complying with Public Right to Know legislation. What levels of toxicity are residents exposed to when they are enjoying a local recreation area and they breathe in fumes from plane after plane as they depart and land at Logan? For years Massport has promised a health study but neglected to follow through. We should not implement Massport's "preferred alternative" before we have real data on the health of residents who live near Logan. It's up to all of us to demand a process which looks at the bigger picture, not a piecemeal analysis of one runway.

I hope you will read beyond the lines of text submitted by Massport and make a careful decision based on the unfair burden of health and safety risks that Massport's "preferred alternative" would add to inner city residents. Many of the people who live closest to the airport are the area's newest immigrants. They don't have money for alternative health modalities. They don't escape Logan's fumes for vacations in the White Mountains. A long promised study on air pollution and health risks in neighborhoods surrounding the airport has yet to be undertaken. Increasing Logan's capacity without full consideration of this data is a travesty we can avoid.

Sincerely,

Laura DeSantis

CC: Senators Kennedy, Kerry, and John Silva

Kehoe, Barbara (ENV)

From: Shawn Damery [s.damery@worldnet.att.net]
Sent: Wednesday, June 06, 2001 9:05 PM
To: Kehoe, Barbara (ENV)
Subject: Runway 14/32

Barbara,

I am emailing you voicing my support of the construction of Runway 14/32 at Logan Airport. I truly believe that the city would greatly benefit from the enhanced convenience that this would provide. Boston would benefit from the commerce that increased tourism would provide as well as make the city more attractive for conventions as well as symposiums, both of which would provide revenue for the state via taxes etc.. Boston is a world class city and it deserves a world class airport.

-Shawn Damery

RECEIVED
JUN 6 2001
MEPA

Letter 344

'Kehoe, Barbara (ENV)

From: tdauria@bu.edu
Sent: Tuesday, June 05, 2001 11:28 AM
To: Kehoe, Barbara (ENV)
Subject: environmental document number EOEA#10458

I would like to give my support to the new runway at logan airport. Boston is well know for allowing the voices of the vocal few to over shadow the needs of the quite majority.

Regards,

Tom

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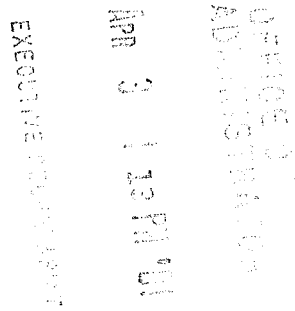
Letter 345

A50010403008 (45)

Author: "Barbara Eisenhaure" <jombi@mediaone.net> at SMTPGate
Date: 4/2/01 8:59 PM
Normal
TO: Jane Garvey at AWAAOAADA
Subject: Logan Airport Expansion
---------- Message Contents

Dear Ms. Garvey,
Everything I have read about proposed runway 14/32 leads me to conclude that thebenefit of possibly a 10% increase in airport capacity does not outweigh the costs to the quality of life in the South Shore communities most affected. I have read that the noise will be "incompatible with residential use." There must be a better solution. Please look for it.
Thank you.
Barbara Eisenhaure



Letter 346

Kehoe, Barbara (ENV)

From: Matt_Esecson@ziba.com
Sent: Tuesday, June 05, 2001 11:24 AM
To: Kehoe, Barbara (ENV)
Subject: environmental document number EOEA#10458.

As a frequent business traveler, I am again forced to use Manchester NH airport this week, because delays at Logan make it such a poor experience. We can't be a world class city with a poor airport. Add a lane.

Matt Esecson
Director Business Development
ZIBA Boston
(978)729-0066

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Letter 347

'Kehoe, Barbara (ENV)

From: Paul Faler [paul.faler@umb.edu]
Sent: Tuesday, June 05, 2001 8:59 PM
To: Kehoe, Barbara (ENV)
Subject: new Logan runway

Message to Robert Durand: I do support the construction of a new runway at Logan airport. i think there are a number of compelling arguments that justify the building of runway
14/32. I believe the relevant document re the environmental impact is Eoea #10458.

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Letter 348

Kehoe, Barbara (ENV)

From: Sara S.farkho [sahara5642@yahoo.com]
Sent: Tuesday, June 05, 2001 5:48 PM
To: Kehoe, Barbara (ENV)
Subject: I beg you to do something about Logan,

Dear Madam,
Hi,
I just want to ask you to do anything in your power about Logan runway.
Many times in happened to myself that after getting to Logan airport we the airplane just kept circling for almost45 minutes to get permission to land! and I am really tired of these delays also.

I will appreciate your help.

Thank you
Sahar

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Kehoe, Barbara (ENV)

From: Randy Fuller [rfuller@emperative.com]
Sent: Tuesday, June 05, 2001 9:49 PM
To: Kehoe, Barbara (ENV)
Subject: Yes on 14/32

Barbara,

I am VP of Marketing for a growing software company in Waltham. Air travel is critical to our success and I am thoroghly embarrassed by the length of time spent on delayed flights or sitting on runways at Logan. The consensus of my peers in the industry is that Logan is second worst only to Newark in terms of preferred air travel. Half our company is in Denver and continually gives us grief over how much better travel from DIA is compared to Logan.

Please support the new runway. Please don't let air travel turn people away from our vibrant technology economy.

Randy

Randy Fuller
781-663-1251
www.emperative.com

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Kehoe, Barbara (ENV)

From: kgabler [kgabler@email.msn.com]
Sent: Wednesday, June 06, 2001 12:11 AM
To: Kehoe, Barbara (ENV)
Subject: runway 14/32

Dear Ms. Kehoe:

It is important that runway 14/32 be approved ASAP to reduce delays for travelers, reduce noise for the neighbors and direct more flights over Boston Harbor. Document EOEA#10458 says it all. Please help expedite this much needed public improvement. Thank you.

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